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JOURNAL

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BOOKLET MAKES A HIT

To all appearances the booklet, "Nothing to Sell but His Services," which was announced in the November issue of the JOURNAL, has made a distinct hit, not only with practitioners, but with veterinarians in other branches of the profession. One of our members, a veterinarian connected with an agricultural college, wrote in and asked for sufficient copies to place one in the hands of every senior agricultural student. The Dean of one of our veterinary colleges has asked us to quote him a price on a thousand copies. It is his intention to enclose one of the booklets in every letter going out of his office.

A member of the Executive Board, who had seen the material for the booklet in the rough, when a copy of the finished product was sent him, wrote as follows: "I congratulate you on the publication of this booklet. I feel that it will be a stimulus to many a wayward layman who does not credit in full measure the value of a veterinarian who makes an effort to measure up with the profession. It may serve to make the stockman more selective in his choice of the man he calls."

A practitioner, with more than his share of natural modesty, ordered 100 copies and made the following observation: "I

think that this is a step in the right direction, one which should have been taken long ago. The only objection is that fellows like myself are handing out a little more than they are are entitled to, when they hand out this booklet." Another practitioner expressed his appreciation in the following terms: "The booklet strikes me as being something of a masterpiece, and should be in the hands of every breeder in the country." "Just what we want," wrote another practitioner from the Pacific coast.

As previously announced, we are supplying the booklet in any quantity at the rate of $1.00 per hundred post paid. Our first edition was completely exhausted in short order and a second edition has been printed. At the rate the requisitions for the booklet are coming in, it is likely that we will have to have a third edition printed very soon.

VETERINARIANS GET INSURANCE

To Dr. Irving Moles, of Central City, Iowa, goes the honor of having made the first application for veterinarians' liability insurance under the plan recently announced in the JOURNAL. Dr. Moles took out a policy for two years, taking advantage of the reduced rate offered. Dr. M. A. Taffe, of Graceville, Minn., was the second, taking a policy for one year. Dr. R. J. Schermerhorn, of Redlands, Calif., was number three, with a two-year policy, closely followed by Dr. A. E. Stettler, of Columbus Grove, Ohio, with a one-year policy.

TUBERCULOSIS LAW UPHELD IN IOWA

The Supreme Court of Iowa handed down a decision, October 27, 1925, upon a case which had been brought in Black Hawk County, to test the right of the State to enforce tuberculin testing under the accredited area plan. In addition to determining that the State has the power to enforce the law now on the statutes, the decision goes even further, saying that the Legislature has the power to make almost any kind of a law that appears necessary for the purpose of preventing the spread of animal diseases or to bring about the condemnation and proper disposition of animals which may already be infected with a dangerous disease. The decision was of crucial importance to the work of tuberculosis eradication in Iowa and it is expected

that a number of other similar cases which have been pending in district courts throughout the State will now be dismissed. The Supreme Court, in its decision, struck a decisive blow to the enemies of bovine tuberculosis eradication work, not only in Iowa but elsewhere.

IN THE SAME MAIL

Just a few days ago, in the same mail, we received two letters each of which contained remittances for dues. On the slips accompanying the checks, each member had taken the time to write a very brief note. On one we found this:

"Business and collections are very good."

Turning to the other, this is what we read:

"Darned hard to keep going."

A day or so later we receved back one of our second notices that dues were due. The check was with it, all right, but all that the member had time to write on his slip was this: "Been asleep."

And so it goes.

APPLICATIONS FOR MEMBERSHIP

(See October, 1925, JOURNAL)

FIRST LISTING

GOSS, RAYMOND C. Middlebury, Vt.
B. V. Sc., Ontario Veterinary College, 1916
Vouchers: Lionel H. Adams and C. D. McGilvray.

HUMPHREYS, BERNARD F. 839 East 42nd Place, Chicago, Ill.
D. V. S., McGill University, 1900
Vouchers: Dr. E. L. Quitman and James Robertson.

LEARMONTH, ROBERT 134½ W. Grand River Ave., East Lansing, Mich.
D. V. M., Michigan State College, 1925
Vouchers: Ward Giltner and E. T. Hallman.

WHIFFING, HARRY E. 903 W. Meridian St., Lebanon, Ind.
D. V. M., Indiana Veterinary College, 1915
Vouchers: E. A. Cahill and H. Preston Hoskins.

APPLICATIONS PENDING

SECOND LISTING

Bescoby, Felix Harold, 5242 W. Washington Blvd., Los Angeles, Calif.
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Lames, H. S., La Porte City, Iowa.
Lebish, Jacob, 887 Melrose Ave., Bronx, N. Y.
McMurray, Arthur A., 105 State Office Bldg., Trenton, N. J.
Onissimenko, Vassily Nicolaevich, Makawao, Maui, Hawaii.
Osorio, Rafael A., la Filomeno Mata No. 6, Mexico, D. F., Mex.
Parson, Arthur Theodore, Warren, Pa.
Rau, Benjamin, Vet. Hospital, 39th St. & Woodland Ave., Philadelphia, Pa.
Stevens, V. H., 143 So. Commercial St., Steubenville, Ohio.

COMING VETERINARY MEETINGS

Horse Association of America. Blackstone Hotel, Chicago, Ill. Dec. 2, 1925. Mr. Wayne Dinsmore, Secretary, Union Stock Yards, Chicago, Ill.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. Dec. 2, 1925. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

B. A. I. Veterinarians, National Association of. Atlantic Hotel, Chicago, Ill. Dec. 2-3-4, 1925. Dr. J. S. Grove, Secretary, 218 Live Stock Exchange, Fort Worth, Tex.

U. S. Live Stock Sanitary Association, LaSalle Hotel, Chicago, Ill. Dec. 2-3-4, 1925. Dr. O. E. Dyson, Secretary, 923 Exchange Bldg., Kansas City, Mo.

Illinois State Veterinary Medical Association. Chicago, Ill. Dec. 4, 1925. Dr. L. A. Merillat, Secretary, 1827 So. Wabash Ave., Chicago, Ill.

Nebraska State Veterinary Medical Association. Omaha, Nebr. Dec. 8-9, 1925. Dr. F. R. Woodring, Secretary, Lincoln, Nebr.

Central Michigan Veterinary Medical Association. Otsego Hotel, Jackson, Mich. Dec. 10, 1925. Dr. W. M. Armstrong, Secretary, Concord, Mich.

First District (Ohio) Veterinary Association. Milford Center, Ohio. Dec. 10, 1925. Dr. H. H. Kettler, Secretary, Milford Center, Ohio.

Western New York Veterinary Medical Association. Buffalo, N. Y. Dec. 10, 1925. Dr. F. F. Fehr, Secretary, 243 So. Elmwood Ave., Buffalo, N. Y.

Delaware Veterinary Medical Association. University of Delaware, Newark, Del. Dec. 18, 1925. Dr. C. C. Palmer, Secretary, Newark, Del.

Missouri, University of, First Short Course for Veterinarians. Columbia, Mo. Dec. 28-31, 1925.

Massachusetts Veterinary Association. American House, Boston, Mass. Dec. 30, 1925. Dr. H. W. Jakeman, Secretary, 44 Bromfield St., Boston, Mass.

Nevada State Veterinary Association. Reno, Nev. Jan. 4, 1926. Dr. Edward Records, Secretary, Reno, Nev.

Pennsylvania Conference of Veterinarians, University of. Philadelphia, Pa. Jan. 5-6, 1926. Dr. Louis A. Klein, Dean, 39th St. & Woodland Ave., Philadelphia, Pa.

California State Veterinary Medical Association and University of California Veterinary Conference. Davis and Sacramento, Calif. Jan. 5-6-7-8, 1926. Dr. J. P. Bushong, Secretary, 414 No. Larchmont Blvd., Los Angeles, Calif.

Kansas Veterinary Medical Association. Topeka, Kans. Jan. 6-7, 1926. Dr. Charles Bower, Secretary, Topeka, Kans.

Ohio State Veterinary Medical Association. Ohio State University, Columbus, Ohio. Jan 7-8, 1926. Dr. W. R. Hobbs, Secretary, Ohio State Univ., Columbus, Ohio.

Oklahoma State Veterinary Medical Association. Lee-Huckins Hotel, Oklahoma City, Okla. Jan. 11-12, 1926. Dr. C. H. McElroy, Secretary, Stillwater, Okla.

Indiana Veterinary Medical Association. Hotel Severin, Indianapolis, Ind. Jan. 12-13-14, 1926. Dr. R. H. Boyd, Secretary, 446 E. 10th St., Indianapolis, Ind.

Cornell University, Eighteenth Annual Conference for Veterinarians at. Ithaca, N. Y. Jan. 14-15, 1926. Dr. V. A. Moore, Dean, N. Y. State Veterinary College, Ithaca, N. Y.

Minnesota State Veterinary Medical Association. St. Paul, Minn. Jan. 14-15, 1926. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.

Virginia State Veterinary Medical Association. Richmond, Va. Jan 14-15, 1926. Dr. W. H. Ellett, Secretary, Midlothian, Va.

Mississippi State Veterinary Medical Association. Greenwood, Miss. Jan. 18-19, 1926. Dr. C. G. Stalworth, Secretary, Drew, Miss.

Texas State Veterinary Medical Association. Fort Worth, Tex. Jan. 20-21, 1926. Dr. D. Pearce, Secretary, Leonard, Tex.

Arkansas Veterinary Association. Hotel Marion, Little Rock, Ark. Jan. 21, 1926. Dr. Hubert Shull, Secretary, Texarkana, Ark.

Maryland State Veterinary Medical Association. Medical Hall, Baltimore, Md. Jan. 21, 1926. Dr. E. M. Pickens, Secretary, College Park, Md.

South Dakota Veterinary Medical Association. Sioux Falls, So. Dak. Jan. 28-29, 1926. Dr. C. C. Lipp, Secretary, Brookings, So. Dak.

STATE BOARD EXAMINATION

Arkansas Veterinary Examining Board. Old State House, Little Rock, Ark. Jan. 20, 1926. Dr. Joe H. Bux, Secretary, Old State House, Little Rock, Ark.

NEW PHASES IN THE CONTROL OF ANTHRAX THROUGH VACCINATION*

By A. EICHHORN

Pearl River, New York

Since the inauguration of the control of anthrax through vaccination, in the United States, several methods have been employed, and through scientific work and practical experience, valuable knowledge has been gained on anthrax immunization.

The first efforts in controlling anthrax by vaccination consisted in the administration of the Pasteur vaccine. The credit for introducing this form of vaccination in the early days is due to Dr. W. H. Dalrymple, who was the first to employ this valuable product in the control of anthrax in the state of Louisiana. Since that time, the vaccines prepared according to the Pasteur method have been used to a great extent throughout the anthrax districts of the United States, and its use was not only limited to the product prepared by the Pasteur Institute, but likewise domestic laboratories have embarked upon the production of the Pasteur vaccine and distributed the same through the various channels of commerce.

The Pasteur vaccine, as is well known, consisted of the injection of the No. 1 and No. 2 vaccines, the difference in the two being the degree of attenuation; and while Pasteur, in his classical work, conclusively established the value of his method of immunization, experiences with the commercial product were not entirely satisfactory. Reports on its effectiveness, from the very extensive use of this form of immunization, differed, and while the summary of the statistical data would show a very pronounced reduction following the use of the Pasteur vaccine, a closer analysis reveals that in certain notorious anthrax districts, the vaccination frequently failed to produce in the animals a sufficient resistance against the natural exposure. This might be attributed to two factors, one of them being that the vaccine prepared according to Pasteur's method has not sufficient keeping qualities to withstand the exposure of long shipments and when kept in stock at room temperature.

Another important factor, no doubt, to which could be attributed the failure of the vaccination, was the insufficient

*Presented at the Sixty-second Annual Meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

resistance which the vaccination conferred upon the animals. This was especially the case in the notorious anthrax districts, where in some years, due to the climatic conditions, the multiplication of the infective agent, together with the increased virulence, required an unusually high resistance in the exposed animals, which in turn was not attainable with the double vaccination by the Pasteur method.

At the time the Pasteur vaccination solely was depended upon for protection of the animals against anthrax, complaints of numerous failures from this form of vaccination were received by the Bureau of Animal Industry at Washington. As a result, it was deemed advisable to subject samples of the anthrax vaccines, prepared both in this country and abroad, to potency tests. These tests were not confined to small animals only, but also to sheep, and as a result of these tests, it was found that 60 per cent of the products used were inert. These findings clearly demonstrated the reasons for the failures from the vaccination, which at times reached very serious proportions.

A Standardized Vaccine Desired

Subsequently, the writer undertook experimental work to develop, if possible, a vaccine which could be accurately standardized and which would possess better keeping qualities than the vaccine prepared by the Pasteur method. As a result of these findings, a spore vaccine was developed which, when fixed in glycerinated salt solution, proved to maintain its keeping qualities almost indefinitely, and in which the standardization could be accomplished to a very high degree of accuracy. Together with this vaccine, a serum was prepared, along the line of the Sobernheim method, the combination constituting the simultaneous method of vaccination. This form of vaccination, both experimentally and also in the field, produced most excellent results under ordinary conditions.

Experience, however, for a period of years, in badly infected anthrax districts, has established the fact that even with this procedure, it was impossible at times to prevent losses in vaccinated animals. This also was due primarily to the insufficient immunity developed in animals following vaccination. Careful observations have established that the simultaneous vaccination will confer an immunity upon the animals which is not of a very high degree, however, and will not protect the animal against unusually heavy exposure of high virulence. It is also an ac-

cepted fact that in certain localities, where the disease is not widely spread and is of low virulence, the simultaneous vaccination proved sufficient for the protection of the animals.

The observations in the recognized anthrax districts, on the other hand, proved the necessity for a higher degree of immunity in the vaccinated animals and, as a result, a No. 3 and a No. 4 vaccine were developed to supplement the simultaneous vaccination for the purpose of conferring upon the vaccinated animals a higher degree of immunity. The injection of the No. 3 and No. 4 vaccines, following the simultaneous treatment, given approximately ten days apart, proved to be of material advantage in anthrax immunization, but even by following this procedure, failures were noted, and veterinarians deemed it advisable, especially in anthrax districts, to employ the No. 3 and No. 4 vaccines with larger doses of serum, in order to produce a quick and effective immunity.

Old Vaccine Unsatisfactory

Thus, effective vaccination in the notorious anthrax districts was still considered unsolved, and at meetings of many veterinary associations, especially in the states of Louisiana, Arkansas, and Mississippi, numerous expressions against the present method of vaccination were filed; likewise, state veterinarians and live stock sanitarians of these states, who had the opportunity to gather accurate data on the results of the vaccinations, also felt the necessity for a vaccine of higher immunizing value.

The writer, after attending many meetings of the veterinary associations and consulting with the state veterinarians and others interested in the anthrax problem, came to the conclusion that, in order to make anthrax vaccination effective in the Southern states, it would require a vaccination which will bring about a response from the vaccinated animal in the form of a local or general reaction.

Investigators, who have studied the control of anthrax, have long realized the fact that whenever reactions are induced in animals as a result of the vaccination, an immunity is produced which is greater than when no reaction follows. The writer has also observed this fact on several hundred horses used in the production of anti-anthrax serum. In all instances, when horses responded to the injection of anthrax vaccines with a local or general reaction, these animals subsequently proved to

possess a higher degree of immunity than if such reaction was not produced.

It has further been noted that in the horses in which the reactions have been produced, the process of hyperimmunization could be carried out more rapidly and with the greatest degree of safety. With this available information and the continuous demand for a more effective immunization in the field, the writer studied many different strains of anthrax organisms, in various degrees of attenuation, with a view to developing one which would induce reactions in the injected animals and, at the same time, not be dangerous to the life of the animal.

Suitable Strain Obtained

Among the many different strains studied, we obtained one which proved very satisfactory for spore production and produced, at the same time, in the vaccinated animals, reactions of varying degrees. This strain was carefully tested upon small animals and proved to conform very closely to Pasteur's No. 2 vaccine, killing guinea pigs regularly and small rabbits only occasionally. The reaction induced in horses by this vaccine varied from a slight edematous swelling at the point of injection to a general enlargement of the neck. The swelling, as a rule, appears the second or third day after the vaccination, and subsides in from two to three days. In some cases, where the swelling is of an unusual size, it persists for five and even seven to ten days.

In the great majority of cases, the local reaction is not accompanied by a constitutional disturbance. In some cases, however, especially where the swelling is very pronounced, an elevation of temperature is observed, which may reach 104° F. Only in exceptional cases is it necessary to resort to serum injections in such reacting animals. The vigorous, healthy animals, even though reacting markedly to the vaccination, do not require special care or attention. Only undernourished, overworked animals and those affected with organic diseases might require attention following the vaccination with the more effective vaccine.

Accordingly, it is advisable at all times for the veterinarian, prior to the vaccination, to look over the animals and instruct the owners concerning the reactions to be expected from the vaccination. Furthermore, when arrangements are made for

vaccinating, the owners should be advised that the best results from the vaccination are obtained in animals which have been rested for at least one day, and that, following the vaccination, the animals should not be subjected to hard, fatiguing work for at least two to three days after the vaccination. Severely reacting animals should not be worked until the effects of the vaccination have subsided.

Reactions usually develop following the simultaneous vaccination and, in the great majority of cases, in 90 to 95 per cent of the animals vaccinated. The small remaining percentage might react to the injection of the No. 3 vaccine. All others who have previously reacted will not react to the injection of the No. 3 or No. 4 vaccine.

It is a recognized fact that the degree of the reaction is in direct relation to the degree of immunity established. Numerous investigators have confirmed and recorded this view.

Reaction Necessary for Immunity

In a recent publication from Spain, on anthrax immunization, from Government sources, it is stated that in order to develop a high degree of immunity against anthrax, it is necessary that the vaccination produce a general or local reaction in the animals. Furthermore, that unless such reactions are produced, the animals will not develop a sufficient degree of immunity to protect them against unusually heavy exposures, nor does the immunity last for a considerable length of time. In the same publication, it is emphasized that anthrax vaccinations should be employed which will induce such reactions.

In a recent address by Professor Detre, he brought out the fact that the ordinary vaccination with Pasteur's Nos. 1 and 2 vaccines does not induce a sufficiently lasting immunity, and in order to protect the animals in the anthrax district against natural exposure, repeated revaccinations are necessary, in order to maintain the animal resistant against the infection.

In a personal communication from Sir Arnold Theiler, he informed the writer that the experience in South Africa with the control of anthrax had been quite unsatisfactory as long as they employed the usual strength of the Pasteur vaccine. They have tested out the commercial and other vaccines from the different countries of the world and failed to produce with them experimentally a sufficient immunity against the artificial exposure. Following this experience, they have developed a vac-

cine which produces, in a large proportion of the cases, a local reaction which sometimes is associated with even a general reaction. The animals developing the reaction prove to possess a high degree of immunity, and are effectively protected against unusually severe exposures under natural conditions.

In our own experimental work, we have found that an anthrax vaccine which produces local reactions consistently is by far more effective than one which does not. The experimental tests on animals, following the reaction, have proved them to be immune to unusually large infective doses of virulent anthrax organisms. They likewise resisted the feeding of food heavily contaminated with anthrax spores. This very high resistance against the infection persisted for three months, but might have been even for a much longer time. The experiments, however, were not continued after that period.

Horses React Severely

In 1925, we distributed over 50,000 doses of this more virulent vaccine, which induced a reaction in 95 per cent of the animals vaccinated. The extent of the reactions varied. In cattle, they usually are confined to small local reactions, with very little or no systemic disturbance. In mules, the reactions were of moderate size, appearing at the point of inoculation and persisting for three to seven days. In a very few cases, the reaction involved a large portion of the neck, in the form of an edematous infiltration, and, in isolated cases, a general disturbance has been observed, associated with high temperature and inappetance. In horses, the reaction in some instances was very pronounced, the edematous swelling at times involving the entire side of the neck and even the lower chest. Likewise, the constitutional reaction was more frequent in horses. However, fatalities were recorded in only a few isolated cases. The statistical data on the direct losses from the vaccination have proved that mules and cattle can be safely vaccinated with a vaccine inducing a reaction. In horses, such vaccines may cause an occasional death. From our experience, such losses are about one-quarter to one per cent, which must be considered, in notorious anthrax districts, as insignificant when compared with the high degree of immunity which is produced by such vaccination. Practically no losses occurred among cattle and mules.

Vaccination in notorious anthrax districts should be undertaken with vaccines of a potency which will insure protection

to the animals. This applies especially to some of the southern states, such as Louisiana, Arkansas, and Mississippi, where it is known that in some years, when conditions are especially favorable for anthrax infections, the ordinary vaccination has not yielded the desired results. The live stock sanitarians of those states have repeatedly expressed their desire for a more effective vaccine, and, in view of the fact that losses from vaccinations with the more virulent vaccines can be reduced to a minimum, there is no reason why veterinarians should not employ products which will protect the vaccinated animals against the most severe exposures to which they may be subjected.

It is realized that the appearance of reactions, if they are unexpected, may be alarming both to the veterinarian and to the stockman. However, if the owner of the animals is told what may be expected from the vaccination, and also that a vaccine inducing a reaction is an indication of a high degree of immunity, there should be no difficulty in convincing him of the advantages. The use of this form of vaccination should be encouraged, especially in the notorious anthrax districts of the South.

The authorities who have been engaged in the investigations of anthrax control have long recognized the fact that the highest degree of immunity is obtained in animals responding to the vaccination with a reaction. Thus, we note, in Klimmer's textbook on "Serum Therapy," the following statement:

> "As a rule, the reaction following the vaccination of the animals follows the injection of the second vaccine. This reaction is very desirable, provided it is limited to a general disturbance of a short duration and to limited local symptoms such as edema, later not infrequently an edematous infiltration at the point of inoculation. Experience has shown that in the majority of cases, the immunity develops only when local edema follows the vaccination, and the immunity reaches its height as soon as the resulting edema is absorbed."

Thus, it is apparent that in the control of anthrax by vaccination, it should be aimed to induce local reactions with the vaccination, as only through such local reaction can we have an assurance of an effective immunity.

Conclusions

In the control of anthrax by vaccination, it is desirable to employ a vaccine which induces a local or general reaction.

Such a vaccine, of proper standardization, induces a maximum degree of immunity which will protect the animals through the period of the anthrax season.

Local and general reactions, as a rule, do not endanger the life of the animal, and subside without any interference.

Direct losses from the vaccination are very insignificant and should not discourage the use of such a vaccine in badly infected anthrax districts.

For some unknown reason, horses appear to be more responsive to such a vaccine than mules and cattle, the losses following the vaccination having been limited practically to horses. The owners should be informed of the occurrence of such reactions, and also of their advantages.

Effective immunization in notorious anthrax districts will be possible only by employing a vaccine inducing reactions.

Discussion

Dr. N. F. Williams: Although you gentlemen may not be vitally interested in anthrax at this moment, it may come to you at any time. Districts that ordinarily are considered to be immune might be approximated by an anthrax infection, it may break out without apparent access from other districts, it may be isolated apparently.

The thought comes that perhaps we are not recognizing anthrax where it appears in a new locality. The death of one animal does not cause an investigation and a pasture becomes infected. Then the time comes when the conditions are right and animals pasturing in that particular pasture become infected.

To every veterinarian this subject will be of interest and to those who are not particularly interested at this time I sound a word of warning as to what is being done along this line. The serum-vaccine method is not ideal, but it is the best that science has given up to this time. This is no criticism of the product and we would not hesitate to use that product. It is difficult to reconcile the action of vaccine in certain outbreaks. Of course, if we remain contented we are satisfied and will not progress.

Of late I have discounted a great deal of what has come to us from across the water. Americans are as capable of carrying on these investigations as the investigators of foreign countries. We are looking for American investigators and scientists to find something for us that will be one hundred per cent efficient.

Dr. F. W. Wood: I was rather surprised and very much pleased to hear Dr. Eichhorn's paper this morning. In previous conversations with Dr. Eichhorn he has always maintained that a properly prepared simultaneous vaccine would offer ample protection against anthrax under almost any field conditions. I was also surprised to note that California was not reported as a dangerous anthrax state. We have areas in California that are certainly badly infected—as bad as any I have seen in any part of the country. They are limited but they are dangerous.

Some years ago, we began preparing what is called a triple vaccine. Simultaneous vaccination was followed with a stronger vaccine called No. 3 and a still stronger one called No. 4. This method gives a high degree of protection against anthrax and will practically prevent all losses for at least one year. The triple method has one great disadvantage. It requires animals to be presented for vaccination three times, and also requires that the same animals must be presented regularly. This is sometimes difficult under range conditions.

An equally effective method of immunization is that of using No. 4 vaccine with increased doses of serum, and following that with No. 4 vaccine without serum. No. 4 vaccine, with increased doses of serum, will usually give ample protection against anthrax. We have found that for range stock 20 cc of serum and No. 4 vaccine is safe. For breeding bulls and dairy stock, a dose of 35 cc. For horses and mules, 50 cc of serum and No. 4 vaccine is used. In handling

anthrax outbreaks I believe the best results can be obtained by giving 100 cc of serum to all exposed animals and treating them at the same time with No. 4 vaccine.

DR. EICHHORN: I recognize the fact that I made the statement referred to by Dr. Wood—that is, that the simultaneous injection is proving effective under field conditions. This was in the early days, when we did not have all the information we have at the present time. However, through personal experience, as well as through discussing the progress made in the control of anthrax in some of the southern districts, I have to realize the fact that the simultaneous vaccination has not come up to full expectations. In view of these observations I came to the present conclusions and I think it is the privilege to every one to retract anything he said when he recognizes that he was mistaken. (Applause)

DR. J. E. MCCOY: With regard to the anthrax vaccination as brought out by Dr. Wood, I believe, myself, that control is possible. There is, however, this difficulty: In the southern states, one veterinarian will use one cc of vaccine and 20 cc of serum, and some other veterinarian will use some other dosage. In other words, there is no uniformity in the work of the veterinarians. On the other hand, if they were to adopt a uniform method they would know how to proceed with the directions given them.

What is the length of time that the immunity remains by this new method?

DR. EICHHORN: It is difficult to say. The development of a local or general reaction in a vaccinated animal is in my opinion a sufficient proof of a high degree of immunity and will protect the animal for at least the anthrax season, that is during the period when anthrax is most apt to develop, which is from the spring until the fall or winter.

DR. VAWTER: How soon does Dr. Eichhorn expect a negative phase to be replaced by a positive?

DR. EICHHORN: In effective vaccinations, especially when it is followed by systemic or local reactions the height of the maximum immunity is developed after the complete subsidence of the reaction. During the period of reaction the animal is no doubt in the negative phase. If a product is used which failed to induce any reaction the negative phase is no doubt shorter than when a product is used which does produce a reaction, but the degree of immunity and the duration of the immunity will also vary accordingly.

DR. R. A. CALDWELL: I would like to ask Dr. Eichhorn if he thinks an animal, already infected with anthrax, would not have death hastened by receiving a large dose of serum.

DR. EICHHORN: No. On the contrary benefit would be derived from the injection of large doses of serum and if a sufficient quantity is injected, especially in the early stages of the disease, a recovery is probable.

DR. CALDWELL: Would the administration of the spore vaccine do any harm and hasten the death of the animal?

DR. EICHHORN: Probably it would. There is no doubt but that the injection of a living virus into an infected animal would not influence favorably the course of the disease and for this reason it is advisable to observe the animals prior to vaccination and do not inject vaccine into those which show clinical manifestations or an elevation of temperature.

DR. CALDWELL: I want to say that with the 100 cc of serum, administered to all animals on the same pasture, and treating the other animals the next day, I had one sick animal and was not able to save him. The question is: Does the administration of the spore vaccine tend to save him? Following the vaccination you find the animal normal today and the next day he shows a temperature of 106 or more and other visible symptoms.

DR. EICHHORN: In an attempt to control anthrax in a herd in which the disease is very extensive, in order to obtain the quickest results, the vaccination of the animals with serum alone is justifiable.

ENZOOTIC HEPATIC CIRRHOSIS OF HORSES*
(Walking Disease)
IN THE PACIFIC NORTHWEST

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HISTORICAL

Hepatic cirrhosis of horses occurs enzootically in a number of districts in the Pacific Northwest. Locally the disease is commonly referred to as "walking disease," because of the characteristic symptom of aimless wandering manifested by about eighty per cent of the affected animals at one time or another during the course of the trouble. This disease has been reported from only some of the wheat-producing sections. Although it is found to some extent in sporadic form every year, it is only periodically that the condition is found affecting any great number of animals. In Walla Walla County, Washington, where the trouble is probably most prevalent, the first outbreak of which there appears to be any knowledge occurred over thirty years ago, when several hundred horses died.

Hepatic cirrhosis affecting domestic animals and occurring enzootically is by no means confined to the Pacific Northwest. A number of investigators have in the past reported similar affections, insofar as the liver lesions are concerned. A variety of common names have been coined for the disease in different localities where it occurs. An ailment of horses known as Schweinsberger[1] sickness, "first noted at Schweinberg, in the valley of the Ohm, in the electorate of Hesse, and later, in many other parts of Germany," appears to be identical in symptoms and lesions with hepatic cirrhosis in this country. It is said to occur enzootically in swampy, peaty districts, which are subject to frequent inundation.

A similar disease affecting only horses and locally known as "bottom disease" was reported in 1892 by Dr. E. C. Schroeder.[2]

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He reported the disease existing on the bottom lands along the Missouri River, in South Dakota, Nebraska and Iowa. According to this author, "the affection occurs in all horses from two years old upwards, in horses running in pasture, and less frequently among work horses. Mules, I am told, have never suffered, and are for this reason used by many farmers. Other animals, cattle, etc., are also immune."

In 1893 an enzootic disease of cattle described as "biliary cirrhosis of the liver in cattle," and commonly called "Pictou cattle disease," was reported by Wyatt Johnston[3] as occurring in Nova Scotia. According to this author, "the malady is limited to the counties of Pictou and Antigenish, and has been known to exist there upwards of 30 years."

In 1900 J. A. Gilruth[4] reported the occurrence of a disease in New Zealand which he called "cirrhosis of the liver in horses and cattle." The disease was reported as "occurring in a certain province (Southland) of the colony, where it is commonly known as "Winton disease." Later, in 1902, this same author[5] reported the disease as occurring also in a small portion of the Waikato district of the Auckland Province in New Zealand.

William Robertson[6] described, in 1906, under the title of "Cirrhosis of the Liver in Stock in Cape Colony," a disease occurring in both horses and cattle and similar in the former to walking disease. In those regions where it occurs it is commonly known as stomach staggers in horses.

Occurrence

In the Pacific Northwest enzootic cirrhosis, or so-called "walking disease," has thus far been reported as affecting horses only. Mules are apparently immune to this disease and for this reason are being used on many farms where the condition is prevalent, in preference to horses. As far as is known the malady is confined to local districts in the following counties: Walla Walla, in Washington, and Umatilla, Morrow and Gilliam, in Oregon. The disease is found in the wheat-growing sections or at least on farms where the stock has access to stubble-fields or straw-stacks, and it is more prevalent one year than another. In Walla Walla County, where the condition is prevalent, the land is rolling or hilly, dry farming is the rule and the animals never have access to swamps. In fact, the country is notably free from swamps and water-holes; the drinking-water comes from springs or wells. Walking disease is most prevalent in the early spring,

continuing until after harvest, after which it usually abates. It is more prevalent following a dry year, where there has been a shortage of green feed, which necessitates maintaining horses during the fall and winter on wheat stubble and straw-stacks. Horses which are stable-fed with hay and grain do not develop the disease, but sometimes a case develops when such stable-fed animals are turned out to straw-stacks and on stubble for only a few days.

A similar condition which may have a like origin is occasionally encountered affecting cattle and not uncommonly seen in hogs. Autopsy reveals a cirrhotic liver, but clinically delirium is not manifested in hogs.

Etiology

In his report on "bottom disease," Schroeder[2] says: "The cause of the trouble remains in the dark. In the locality it is generally attributed to a weed known as the 'rattlebox' or 'rattlesnake weed,' a plant of leguminous order which bears the name '*Crotalaria sagittalis.*'" He further makes the statement that "the hay is probably a little coarse, particularly on the bottom lands where the greater number of deaths occur, and this is fed in large quantities, in many instances, to the exclusion of other substances. Hence it is not impossible that the affection is due to the long continued feeding of a substance great in volume and small in nutritive value."

McEachran[3] expressed the opinion that "Pictou cattle disease" was due to the feeding of over-ripe hay which was deficient in albuminoids. He likened the affection to a similar condition in people during famines when they fill their stomachs with anything for want of solid food. Johnston[3] says that many farmers believed the trouble was due to the eating of a weed "ragwort" (*Senecio jacobaeus*).

Gilruth[5] states that it is popularly believed in New Zealand that "Winton disease," affecting both cattle and horses, is due to their eating this same plant (*Senecio jacobaeus*). He also reports two experiments with six-months-old calves in which he was able to produce a form of hepatic cirrhosis by the feeding of ragwort. The dairy ration of these calves consisted of ragwort six pounds, bran two pounds, and chaffed oaten sheaves, two pounds. Feeding was continued for seventeen days. One calf died on the twenty-seventh day of the experiment and the other on the twenty-ninth day.

Robertson reports a series of experiments with both cattle and horses in which he claims to have produced typical cases of hepatic cirrhosis by the feedng of two species of ragwort (*Senecio burchelli* and *Senecio latifolius*). In two experiments with steers, death was caused in five days by feeding daily four ounces and eight ounces respectively of fresh *Senecio burchelli* and, according to the report, "the postmortem was very similar to the cases of naturally occurring disease, except that the lesions were rather more pronounced." In other experiments where smaller quantities of the plant were fed daily (2 to 6 oz.) death supervened in from three weeks to as many months.

The remarkable thing about the experiments of both Gilruth and Robertson is the short time required to produce lesions and death in experiment animals. In all cases of hepatic cirrhosis which we have observed and autopsied, it is quite evident that the lesions have not developed in a few days or weeks. The extensive formation of fibrous tissue in the liver in the average case is no doubt the result of a long-standing irritation. The condition is essentially chronic in nature and easily recognizable symptoms do not apparently develop until marked changes have occurred in the liver.

On one point most investigators seem to agree and that is that the disease is not infectious or contagious. In most instances where the condition has been investigated, inoculation and cultural experiments have proved negative. Gilruth does report the isolation of an organism from the submucous effusion in the wall of the stomach; this organism, however, proved to be innocuous to calves.

We too have conducted numerous experiments to determine the possibility of infection being responsible for the cause of hepatic cirrhosis. Normal horses have been inoculated with blood, blood serum, peritoneal fluid, and portions of the spleen, liver, kidney and the lymph nodes suspended in normal salt solution, and drenched with the intestinal contents of horses in various stages of the disease. Rabbits and guinea pigs have been inoculated with similar material, but in all instances results have been negative. In addition, various internal organs and tissues of affected animals have been cultured on artificial media but in no instance have we been able to isolate microorganisms.

The nature of the disease, the character of the lesions, the fact that it is restricted to certain localities and the apparent absence of infection all seem to indicate that the condition is most likely

due to some dietary disturbance or at least that it has its origin in the digestive tract. We have not been able to associate the cause of hepatic cirrhosis with any of the species of Senecio in the Pacific Northwest since these plants are not common in the localities where the disease occurs. Many species of the plant occur in the Blue Mountains nearby, but here, as far as we know, the disease is not prevalent. Many other plants, however, chief among which are the lupines and tar weed (*Madia sativa*) are pointed out as the possible cause by farmers.

Intestinal worms in the cecum and colon have been considered by two of us (H. A. T. and J. R. F.) as a possible cause of hepatic cirrhosis. In all cases which have been autopsied various species

FIG. 1. A typical case of hepatic cirrhosis, showing a characteristic symptom—yawning.

of cylicostomes have been present in such enormous numbers that we believe they might have something to do with the cause of the trouble. If the cause of hepatic cirrhosis has its origin in the intestinal tract it may be in the form of some chemical substance which is absorbed through the blood, causing irritation in the liver by way of the portal system. It is possible that either irritant plants or the presence of myriads of parasites may in some way cause the development of noxious materials in the intestinal canal. In so far as we know, there is at the present time no experimental evidence which would indicate the exact cause of hepatic cirrhosis in domestic animals.

Symptoms

Premonitory symptoms are in most cases difficult to recognize unless one has had considerable experience with the disease clinically. This is especially true in idle horses. Probably the earliest recognizable symptom is a slight yellowness of the mucosae of the eyes, nose and mouth and a refusal to eat grain. In working horses the coat of hair may appear unthrifty, does not shed readily and there is a history of sluggishness. In some cases these premonitory symptoms do not develop and the first symptoms may be a furious delirium, followed by death in a few hours or days. Such cases would be clinically classed as acute, but autopsy reveals the fact that they are of long standing in so far as lesions are concerned.

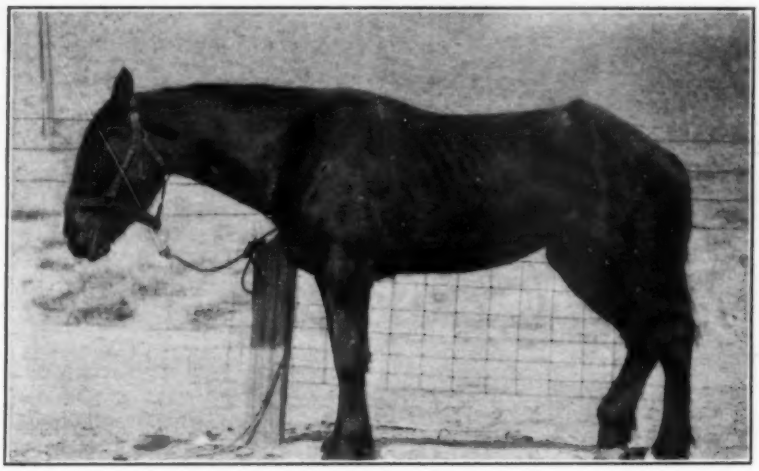

Fig. 2. Another typical case of recent development. Note the sleepy attitude.

In the clinically chronic cases the condition seems to come on more gradually. The visible mucous membranes may become a distinct yellow, although they may at times show congestion. In a case of long standing the membranes may clear up entirely for a time. Small irregularly shaped ulcers usually develop on the mucous membrane of the lips and gums and the inside of the mouth may have an offensive, sour odor. As the disease progresses a gradual emaciation develops. The horse shows an unsteady gait and appears sluggish, sleepy and stupid. If he is tied he will swing in the halter or lean against the manger. If loose he leans against any convenient object such as a fence, building or post. If there is no object near, the animal shifts

his position frequently from one foot to the other and occasionally takes a step or two in order not to lose his balance. He will be observed to gape and yawn frequently; he continues to eat hay but his appetite seems impaired as he does not show the same desire for food as a normal horse, and refuses all grain. He may fall asleep while in the act of mastication or with a portion of the food held between the lips.

FIG. 3. A case of hepatic cirrhosis of long standing. The patient has gone to sleep while chewing a weed.

An affected horse may occasionally stamp with one hind foot as though fighting flies. He may also manifest a licking and sucking movement with the tongue and lips, causing the sucking in of air at the commissures of the mouth. There may be a biting of the lips or a chewing of the manger or other objects within reach, or the patient may eat sticks, weeds, rubbish and

even dirt. In most cases there is a borborygmus. The feces are usually hard, dark brown in color and covered with mucus. As the disease advances many affected horses become restless and desire to travel; they will walk straight ahead, colliding with objects and walking through fences. When in the open country they walk aimlessly for miles. It is from this symptom that the disease has been called "walking disease" and about eighty per cent of all cases develop it sometime during the course of the trouble.

If no accident befalls the patient during this delirious stage there may be a subsidence of these symptoms after a few hours. In some instances there may be only one attack of this nature, the animal subsequently dying without a struggle; in other cases the walking symptoms may recur many times over a period of days or weeks and the animal dies in delirium. Permanent recoveries are unknown. In the last stages of the disease some horses may become much emaciated and there is a noticeable abdominal breathing. The temperature as a rule is normal or subnormal. In a few instances there may be a slight elevation of temperature just prior to death. This is especially true in those animals which die in delirium.

Anatomical Changes

The appearance of the carcass varies, depending upon the duration of the disease and the physical condition of the animal. Some horses are in fairly good condition while others are much emaciated.

The superficial lymphatic nodes, particularly the inguinal, may be normal, slightly congested, hemorrhagic or distinctly gelatinous.

The blood, as it flows from the large blood-vessels which have been severed immediately after destroying an affected horse with strychnin, appears dark in color; it gives the impression of being concentrated and decreased in volume.

The peritoneal cavity may, in an occasional case, contain an increased amount of fluid which may have a slight reddish tinge. This, however, is rather the exception than the rule, as usually there is no indication of ascites. The peritoneum has a fibrinous exudate, attached to it in various places. This is in the form of coagulated threads, about one-half to one inch in length, sometimes fusing together to form a network and firmly attached to the peritoneum. These may be white or grayish in color, but

where they are especially numerous they may assume a reddish or rusty hue. These fibrinous tags are especially thick on the abdominal surface of the diaphragm and the surface of the liver directly in contact with it. They may, however, be found on the surface of the spleen, intestines both large and small, stomach and the parietal walls.

The stomach may be normal in size or it may be greatly enlarged with contained food, sometimes weighing as much as forty to fifty pounds, and indicating an over-loading and possibly paresis. As a rule there are numerous bots present and there may or may not be a catarrhal inflammation of the pyloric end.

As a rule the small intestines are normal, but occasionally they show a congestion of the mucosa throughout their entire length.

The large intestines may appear normal externally. They may show the presence of numerous subserous petechiae and there may be an extensive gelatinous infiltration at the omental attachment. The contents usually appear normal as does the mucous membrane, but occasionally the latter in the large colon and cecum may show indications of catarrhal inflammation. In every case autopsied the contents of the double colon have been found teeming with several species of cylicostomes and the surface of the mucosa was covered with them as well. The cecum also harbors them in lesser numbers.

An estimate of the number of these parasites present was made by counting the individuals in a given quantity of intestinal contents and on a given area of mucosa and multiplying by a given factor representing the whole. Conservative estimates were from 150,000 to 200,000 worms in each infected animal. As many as 120 worms have been counted on a square inch of bowel surface. This parasite is a fine, thread-like worm, a fraction of an inch in length and easily overlooked, even when occurring in large numbers. Species found have been identified by Dr. Maurice C. Hall as *C. nassatum; C. ornatum; C. leptostomum; C. catinatum* var. *pseudocatinatum.* Numerous adult *Strongylus equinus* are also usually present.

The liver is the principal seat of trouble and hence shows the greatest pathological changes. Its appearance, however, shows a great variation, depending on the duration of the condition. In all cases autopsied the disease has existed long enough to show considerable fibrous tissue formation. In the early stages the organ is somewhat larger than normal and appears granular. Later it shrinks in size and may be a bluish-gray color, with the

lobules distinctly outlined. In some cases it is a grayish-brown color and in still others which seem to be most advanced it becomes a distinct green in color. In many instances there appear on the surface peculiar, dark-reddish, gelatinous areas, about four to six millimeters in diameter; these are apparently patches of fibrous tissue. The organ is tough, hard and leathery and creaks under the knife when cut.

The spleen may be normal, it may be slightly enlarged and frequently is studded with petechiae and has many attached fibrinous tags.

The pancreas as a rule is normal. Cases have been autopsied, however, where the organ showed marked edema, calcareous deposits and chronic induration, with an invasion of its substance, in that portion overlying the large colon, by adult *Strongylus equinus* in considerable numbers.

The kidneys may be normal or they may be congested and show cloudy swelling.

The sublumbar and portal lymph nodes may be normal, but sometimes they are gelatinous and hemorrhagic.

The lungs may be normal, they may show a few petechiae or there may be a decided congestion of the superficial veins of these organs.

The pleura may or may not have a few fibrinous tags attached.

The heart may be normal, there may be some edema along the coronary groove, or there may be subepicardial petechiae.

The thoracic lymph nodes may be gelatinous, congested or pigmented.

The mucous membranes of the eyes, nose and mouth as a rule are distinctly yellow and there may be abrasions and ulcers on the inside of the lips.

In those animals where the cranium has been opened there was an excessive amount of spinal fluid and a congestion of the surface vessels of the brain, together with edema of the subarachnoid.

Histological Changes in the Liver

The histological changes in the liver of horses affected with walking disease are apparently identical with those of hepatic cirrhosis described by other investigators previously cited. These changes consist of formation of new connective tissue, hypertrophy of the liver cells and their nuclei, and deposition of pigment. Proliferation of connective tissue apparently first occurs in the interlobular spaces. Normally there is very little connec-

tive tissue here in the horse's liver and it is confined to the areas immediately surrounding the portal canals. In affected horses the interlobular spaces become widened by the formation of bands of fibrous tissue which may partially or completely surround the individual lobules.

Later fibrous tissue bands may invade the lobule itself, growing in toward the central vein and surrounding groups of or individual liver cells. The liver cells themselves, together with their nuclei, show a hypertrophy at first and many of them may show the presence of pigment granules in their cytoplasm. Later pressure of the surrounding connective tissues causes a degeneration, shrinking and death of the liver cells. Many of them disappear and the area which they occupied becomes filled with fibrous tissue. Contraction of the fibrous tissue also apparently operates to obstruct the mouths of the intralobular biliary capillaries, which results in a retention and inspissation of the contained bile. As a rule there is very little, if any, proliferation of bile ducts.

Course and Prognosis

As indicated in a discussion of the symptoms of walking disease, an affected horse may be ill only a few hours or he may be sick for weeks or months. External clinical manifestations of short duration do not necessarily indicate that the disease is of recent origin. Since the mortality is practically one hundred per cent, the prognosis is always unfavorable.

Treatment

Medicinal treatment of individual affected horses which show well-developed cases appears to be useless.

Robertson[6] mentions recoveries or partial recoveries in animals when the condition is recognized early, "after keeping the patient in a stable and feeding dry hay and mealies, giving ordinary condition powders till the skin got right, and then feeding as other stable horses were fed." He does not specify means of diagnosis other than clinical observation.

Gilruth[5] says that "all cases terminated fatally previous to the introduction of the strychnin method of treatment." He does not go into detail regarding such treatment.

For the past two years on farms where walking disease is prevalent we have been practicing the method of systematically "worming" all horses on the place. After fasting the animals for thirty-six hours, oil of chenopodium is administered, followed by

a cathartic. As a means of prevention such treatment has given us very encouraging results.

A further prophylactic measure consists of keeping horses off of stubble and away from straw-stacks and feeding them from mangers or racks in the stable or feed-lot. If straw is fed it should be supplemented with hay and possibly some grain. Individual cases, when recognized early, are also given the "worming" treatment. This is followed with good food, tonics and minerals, with apparently some benefit. A prolonged rest, followed after a time with a repetition of the vermifuge, if indicated by an examination of the feces, is also recommended.

REFERENCES

[1]Friedberger & Frohner: Veterinary Pathology, ii, p. 244.
[2]"Bottom disease" among horses of South Dakota. 8th & 9th Ann. Rpts. B. A. I., U. S. Dept. Agr., (1891-1892), p. 371.
[3]Johnston, Wyatt: Biliary cirrhosis of the liver in cattle. Proc. U. S. Vet. Med. Assoc., (1893), p. 120.
[4]Gilruth, J. A.: Cirrhosis of the liver in horses and cattle. Veterinarian, June 1900, p. 309.
[5]Gilruth, J. A.: Veterinarian, Aug. 1902, p. 436.
[6]Robertson, William: Cirrhosis of the liver in stock in Cape Colony. Jour. Comp. Path. & Therap., June 1906, p. 97.

DISCUSSION

DR. TRIPPEER: One thing that might be added is that, in the treatment of these animals, we have apparently had improvement after the third to the fifth day, either with or without treatment, and have had relapses later on, with a more vigorous attack. The locality in which this occurs is north of Mill Creek, which divides our locality, and on the south side we never have known a case of this disease. It is confined strictly to the area north. The treatment that has given some results was the intravenous injection of normal saline solution, up to as much as two gallons. The results, however, later on proved to be only temporary. Another line of treatment that was used was Harrington's solution, which is a combination of bichlorid of mercury, hydrochloric acid and alcohol, given in 5-cc doses, with camphorated oil. All of the treatments that have brought about any degree of improvement have necessarily been along the line of antiseptics. I have held many post-mortems in the last eighteen years, and have found the various conditions that have been mentioned.

DR. FULLER: I might mention one thing in the paper that might be rather confusing. Under the occurrence of the disease, it was stated that sometimes horses have been kept in the barn and, when turned out on straw-stacks, developed the disease. That was not brought out clearly enough. The disease does not develop in a few days after they have been turned out, but if they have been turned out on a straw-stack, the disease develops four or five months later. We figure they were out and had exposure to feces of other animals, in the feed-lots and around the straw-stacks.

Not much was said about the preventive treatment. It is in an experimental stage at present, but I might say that we have treated at least 400 horses (I have not kept an exact count) for parasites, with the idea of preventing it in herds where it was making its appearance. The treatment that has been most commonly used was spoken of—oil of chenopodium—and the dose about 15 to 18 cc. We take a No. 10 capsule and fill the large end about as full as we can get it. At this time we use aloin boluses as a physic. When this is done for a large herd of horses, it is a big job. When we get a good physic, we get lots of parasites; when we do not get a good physic effect, we do not get so many parasites. When the parasites come, they usually come alive. We think that it is very essential that we get a good physic, in order to rid the animal of most of these parasites. We get lots of bots in many of these cases.

DR. W. H. LYTLE: We have been using botulinus antitoxin. The theory that we have worked on is that these are supposedly chronic cases of botulinus

infection. Our experience has been that the disease occurs in horses that have been fed principally grain hay. The hay we have in Oregon is cut, bound and allowed to dry and is then placed in barns. The barns used are simply sheds and the grain hay is stacked to heights of twenty-five feet, sometimes, and naturally the grain that is on the bottom of the stack is subjected to great pressure, moisture and heat, and conditions are there present for the development of the botulinus organism. It is a known fact that the west coast of the United States is very generally infected with the botulinus organism.

Now, whether or not there is anything in our results, I do not know. The stock owners believe that we have found something. I realize that it may be purely coincidental, because the disease does occur in storms and will disappear very suddenly without any intervention, and it may be that we are simply using a treatment where the disease has become naturally exhausted, but we think we have made some headway; in fact we think it is specific on certain farms, but I would not want to say it had any positive results at all. However, it looks as though it might be clearing up. We use 100 to 150 cc in animals that are showing symptoms, and 80 to 90 for prophylactic treatment. I may say we have had only one animal develop the disease in herds that have been vaccinated. In that same herd there have been other animals die. That might not mean anything, because the animals that did die have been animals that have been out, rather than those that have been treated.

DR. KALKUS: Have you had many recoveries in sick animals?

DR. LYTLE: We have had three cases. The diagnosis may have been wrong. They have not been advanced cases, but have been cases in droves where the disease was present. I was hopeful of getting an animal for the clinic. A man who lives in Gilliam County recently wrote me that there was one horse in his drove that had been vaccinated that was showing the first symptoms of the disease. He mentioned that he had lost one other horse that had not been vaccinated.

DR. P. G. MACKINTOSH: In reference to what Dr. Lytle has just said, and the symptoms described by Dr. Kalkus in hepatic cirrhosis, I would like to give my experience with botulism, of which we have quite a bit in the Yakima Valley. The symptoms are not similar. Either I am wrong in my diagnosis of botulism or I am not clear on my symptoms of hepatic cirrhosis. Up there, several years ago, we had a sugar-beet factory, and some of the farmers got to putting the tops of the sugar beets into the silo. It makes fine silage for cattle, but a horse eating this silage was sure to get the symptoms of botulism, and did not hang over any length of time. Most of them would be dead in three to five days. They also had botulism from eating mouldy corn. So it is not clear to me that there is a similarity between the symptoms of botulism and cirrhosis of the liver, as described by Dr. Kalkus.

DR. LYTLE: In answer to Dr. MacKintosh, I would say that the theory that we have worked on is that cirrhosis of the liver is not necessarily more than a contributing cause, but I believe that in the number of horses that we find on Oregon farms, where they are heavily infested with parasites, there is cirrhosis of the liver in some of them. It is known that the botulinus organism has several types and the antitoxin we use is a preventive agent and will protect against several types. We have had acute cases where the animals die and show no symptoms. They are not numerous, but they do occur.

DR. KALKUS: There are other things that might have been mentioned in the paper, but were omitted because we thought they were not of special importance. One of them Dr. Simms mentioned, the fact that he has made some blood studies of some of these cases. We have also done that. Our particular reason for making the blood studies was to find, if possible, some blood changes that would indicate ways and means of making early diagnoses, before symptoms occur. That was probably not brought out because we wanted to shorten the paper as much as possible. The diagnosis is very difficult, early in the disease. It is quite an evident fact in all autopsy cases that the disease has been of long standing, so the symptoms do not appear until after marked changes have taken place in the liver. We thought if it was possible that parasites had anything to do with it, and it was possible to diagnose by blood examination, that would be something in our favor. However, we were not

able to find any blood changes in early cases. Dr. Simms informs me that he has found, in many cases, a high red count. We have also found some cases with well defined symptoms of long standing, with the red cell count running as high as eight or nine million, but it has not been uniform.

In connection with our investigation we have also had an opportunity to autopsy horses which were not showing any symptoms of hepatic cirrhosis but were on farms where the disease was prevalent at the time. Such animals have been found to harbor a few cylicostomes but these were insignificant in number as compared to our findings in horses with the disease. The liver in such cases was normal.

DR. B. T. SIMMS: I studied horses in Umatilla County, Oregon, which were affected with this disease and found every animal showing polycythemia with red cell counts varying from 8 to 11 million per cubic millimeter. Healthy horses on the ranches where the disease was occurring showed normal numbers of red cells. Consequently I am inclined to believe the disease in question was the cause of the polycythemia. When individual sick animals were observed, for several successive days, there seemed to be some correlation between increased severity of symptoms and further increase in the number of red cells.

What was the condition of the liver in these apparently normal horses on autopsy?

DR. KALKUS: Perfectly normal.

BUREAU TRANSFERS

Dr. Oscar Nelson, from New York, N. Y., to Jersey City, N. J., on meat inspection.

Dr. Samuel Friedman, from Jersey City, N. J., to New York, N. Y., on meat inspection.

Dr. L. J. Allen (Ont. '95) in charge of tick eradication at Fort Worth, Texas, promoted to traveling inspector.

Dr. H. L. Darby (U. S. C. V. S. '04) made acting inspector in charge of tick eradication at Fort Worth, Texas.

Dr. P. P. Taylor (Iowa '07), from Omaha, Nebr., to Huron, So. Dak., in charge of meat inspection.

Dr. Willis V. Ellis, (Iowa '09), from Chicago, Ill., to Huron, So. Dak., on meat inspection.

Dr. W. H. Seabrook, from New York, N. Y., to Brooklyn, N. Y., on meat inspection.

Dr. Clarke Hedley (Cin. '07), from Columbia, S. C., to Philadelphia, Pa., on meat inspection.

Dr. John W. Hermann (Cin. '13), from Washington, N. C., to Newark, N. J., on meat inspection.

Dr. Guy P. Everly (K. C. V. C. '11), from South St. Joseph, Mo., to Denver, Colo., on field inspection.

Dr. C. C. Walch (K. C. V. C. '07), from National Stock Yards, Ill., to South St. Joseph, Mo., on meat inspection.

Dr. Erle W. Nye (Wash. '10), from Chicago, Ill., to Fort Worth, Texas, on meat inspection.

Dr. John E. Bender (O. S. U. '03), from Birmingham, Ala., to Fort Worth, Texas, on field inspection.

Dr. James E. Griffin (McK. '18), from Bismarck, No. Dak., to South St. Paul, Minn., on meat inspection.

Dr. Andrew L. Walsh (Chi. '20), from South St. Paul, Minn., to St. Paul, Minn., on tuberculosis eradication.

Dr. Claud E. Ranney (K. C. V. C. '18), from Des Moines, Iowa, to Denver, Colo., on field inspection.

Dr. Charles A. Raque (Amer. V. C. '93), from Denver, Colo., to Des Moines, Iowa, on tuberculosis eradication.

Dr. Howard C. Wilson (K. C. V. C. '08), from Montgomery, Ala., to Birmingham, Ala., on hog cholera control and tick eradication.

Dr. J. W. Venable (Chi. '15), from Montgomery, Ala., to Birmingham, Ala., on tick eradication.

PROPHYLACTIC IMMUNIZATION OF DOGS AGAINST RABIES BY A SINGLE INJECTION OF A DEAD-VIRUS VACCINE*

By A. S. SCHLINGMAN

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Since Pasteur's historical discovery of antirabic vaccination, many modifications have been developed, the most notable being those of Högyes,[1] Semple,[2] and Cumming.[3] The vaccines of Semple and Cumming differ essentially from the others in that the contained fixed virus is dead. All of these methods of vaccination require from fourteen to twenty-one injections to confer protection on the patient, and are more or less restricted to use in persons exposed to infection by bites from rabid dogs or other animals.

On account of the repeated injections necessary to produce immunity, none of these methods has proved economical or feasible for general use in veterinary practice. However, a modification of the Högyes method, requiring but six injections, has been used extensively with excellent results for the treatment of animals. None of these methods has been practical for the prophylactic immunization of animals, and especially when such a product might be used extensively in an effort to control rabies.

It was not until 1921 that the use of a simple method of prophylactic immunization of dogs against rabies was reported by Umeno and Doi.[4] The vaccine, as originally perfected by these workers, consisted of a 20 per cent suspension of the brains and cords of fixed-virus rabbits in phenolized glycerin water. After holding the suspension at room temperature, or in the refrigerator, for the required length of time, the contained fixed virus, although not dead, was sufficiently attenuated for use.

In the original work, there was reported the development of rabies in but two of 31,307 vaccinated dogs, while, in the same territory, the disease was unchecked in the unvaccinated dogs.

Since the report of this original work, Hata[5] summarizes the results of the use of this vaccine in Japan by stating that only

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41 of 104,629 vaccinated dogs developed rabies, while 1699 of the unvaccinated group contracted the disease, this unvaccinated number being but one-third of the total number of dogs in the two prefectures.

Kondo,[6] working along similar lines, perfected a vaccine made from the brains and cords of dogs infected by subdural injections of fixed virus. The virus in this vaccine was attenuated, but not killed, by the addition of 0.5 per cent phenol and incubation at 37° C. for three days. This vaccine was used in Japan on 20,117 dogs, with no reactions following its injection. Of this number, only four dogs, exposed prior to treatment, developed rabies, the disease occurring within a week following vaccination. No further cases were noted within the year following treatment, although many cases occurred in the unvaccinated dogs.

In America, Eichhorn and Lyon[7,8] found that 5 cc of the attenuated virus vaccine, made according to Umeno and Doi, protected dogs against intraocular infection with street virus; while Reichel and Schneider[9] showed that a single injection of the same amount of dead-virus vaccine would protect these animals against similar infection. Reichel[10] further concludes that a dead-virus vaccine, including 2.5 to 3 per cent total solids in a 5-cc dose, is ample for any dog, regardless of size, and is not too much for the smallest. Schoening,[11] using a vaccine made according to the method of Umeno and Doi, was able to protect dogs against intraocular infection with two strains of street virus, but not against a third.

As to the results obtained in this country, following the use of the single-dose antirabic vaccine, made according to these various methods, Corwin,[12] in Connecticut, reports the satisfactory vaccination of 1600 dogs, with at least six of the vaccinated dogs having been bitten later by a known rabid dog. None of these animals developed rabies.

Dr. F. M. Meader,[13] of the Detroit (Michigan) Department of Health, reports that from May 1, 1924, to May 27, 1925, there were licensed, in the city of Detroit, 12,918 vaccinated dogs, while 34,164 licensed and unlicensed dogs were left unvaccinated. Of the 12,918 vaccinated dogs, only 6 developed rabies, while 200 of the unvaccinated ones contracted the disease. In other words, the incidence of rabies in the unvaccinated dogs was fourteen times as great as in the vaccinated dogs.

In my researches, I undertook to confirm the practicability of a dead-virus vaccine made from the brains and cords of dogs by a modified combination of the methods of Kondo and Semple.

The brains and cords were removed from dogs which had become completely paralyzed, following subdural injection of fixed virus. After emulsification with phenolized physiological saline solution, the suspension of nerve tissue was subjected to incubation at 37° C., followed by refrigeration for a length of time sufficient to destroy the virus as determined by subdural injection of rabbits.

After the necessary sterility tests had been made, several groups of dogs of various weights were injected subcutaneously with 5 cc each of this 4 per cent suspension. In none of the dogs used were there any untoward symptoms noted following the injection of the vaccine, all the animals being held under observation for 25 days following this injection, for the development of immunity.

The fixed virus used in these experiments was of such virulence that a 1-100 suspension injected subdurally into rabbits produced paralysis on the fifth day, followed by death, usually between the seventh and eighth days. The virus was propagated in rabbits, the brain being removed when complete paralysis had set in, and a suspension made immediately. After straining through fine linen, the suspension was held in the refrigerator over night to allow the heavier portions of brain material to settle out. Only the supernatant suspension was used, it being in all cases injected deeply into the brains of the dogs, using a 20-gauge needle. By using a needle of this size, there necessarily followed considerable destruction of the brain tissue, which made the tests much more severe than if the virus had been injected with a smaller needle which just penetrated the dura mater. It was felt that by the intracranial injection of a virus of which the relative virulence was known, the period of incubation and results would be more constant than if street virus was injected by one of the various other methods.

All dogs which remained normal after injection of the virus were held under observation for at least 60 days, at which time they were destroyed. In those animals which died, the diagnosis was confirmed by microscopic examination of the brain and by animal inoculation.

In the first group (table I), all of the dogs were protected against intracranial infection with 0.01 cc of the 1-100 suspension

of fixed virus, which amount was sufficient to produce death from rabies in the control dog within seven days.

TABLE I—*Protection against 0.01 cc of virus. Twenty-five days elapsed between injection of vaccine and virus*

DOG	WT. (lbs.)	VACCINE (cc)	VIRUS (cc)	RESULT
226	26	5	0.01	O. K.
323	20	5	0.01	O. K.
236	22	5	0.01	O. K.
314	18	5	0.01	O. K.
213	18.5	5	0.01	O. K.
800	27	Control	0.01	Dead—7 days

Similar results were obtained in another group of dogs (table II.) The control in this case showed symptoms of paralysis on the seventh day, followed by death on the eighth day.

TABLE II—*Protection against 0.01 cc of virus. Twenty-five days elapsed between injection of vaccine and virus*

DOG	WT. (lbs.)	VACCINE (cc)	VIRUS (cc)	RESULT
652	16	5	0.01	O. K.
653	18	5	0.01	O. K.
654	36	5	0.01	O. K.
655	17.5	5	0.01	O. K.
666	16	5	0.01	O. K.
268	19	Control	0.01	Paralyzed—7 days Dead—8 days

It was found that when the amount of virus injected was increased, the results were rather variable (table III). In this group, the dogs, weighing from 9 to 35 pounds at the time of

TABLE III—*Protection against varying amounts of virus. Twenty-five days elapsed between injection of vaccine and virus*

DOG	WT. (lbs.)	VACCINE (cc)	VIRUS (cc)	RESULT
353	27	5	0.05	O. K.
357	35	5	0.1	Dead—7 days
359	9	5	0.2	Dead—7 days
352	16.5	5	0.3	Dead—7 days
354	19	5	0.4	Dead—7 days
356	30	5	0.5	O. K.
360	19		0.05	Dead—7 days
361	14		0.1	Dead—7 days
362	20	Controls	0.2	Dead—7 days
363	16		0.3	Dead—7 days
364	20		0.4	Dead—7 days
365	26		0.5	Dead—7 days

vaccination, were injected with amounts of virus varying from 0.05 cc to 0.5 cc. The two dogs receiving 0.5 cc and 0.05 cc of the fixed virus were protected against infection, while the other dogs of the group, receiving 0.1 cc, 0.2 cc, 0.3 cc, and 0.4 cc respectively, died of rabies on the eighth day. Control animals receiving similar amounts all died within eight days.

TABLE IV—*Protection against 0.5 cc virus. Twenty-five days elapsed between injection of vaccine and virus*

DOG	WT. (lbs.)	VACCINE (cc)	VIRUS (cc)	RESULT
371	35.5	5	0.5	Dead—8 days
372	37	5	0.5	O. K.
374	21	5	0.5	Dead—8 days
375	25.5	Control	0.5	Dead—8 days

In another group (table IV), where all the dogs received 0.5 cc of the virus, only one of the three which had been vaccinated remained well after injection of the virus. The remaining two treated dogs and the control all died from rabies within eight days.

TABLE V—*Protection against 2 cc virus. Twenty-five days elapsed between injection of vaccine and virus*

DOG	WT. (lbs.)	VACCINE (cc)	VIRUS (cc)	RESULT
502	30	5	2	O. K.
453	12	5	2	O. K.
464	25	5	2	O. K.
281	20	5	2	Dead—6 days (See text)
485	14	5	2	Dead—8 days

In still another group (table V), the dogs were each injected with 2 cc of the virus, with the result that they were all protected, the control dying of rabies on the eighth day. While dog 281 of this group died on the sixth day following the injection of the virus, it had at no time shown any symptoms of rabies. Autopsy, microscopic examination of the brain, cultures, and animal inoculation showed the freedom from rabies, and that death was due to distemper.

At the time of natural infection by the virus of rabies, there is usually more or less laceration of the skin and adjacent tissues, including the nerves and nerve endings. It is absolutely necessary for the virus to come in contact with the injured nerve tissue, through which it travels to the central nervous system,

where it finds a suitable medium for proliferation in sufficient quantity to produce symptoms of the disease and death.

As seen from the results in the foregoing experiments, the amount of virus gaining entrance to the central nervous system, which will produce symptoms of the disease and death, is relatively small (0.01 cc of a 1-100 suspension). This amount of infection, while not the m. l. d. in 100 per cent of the animals, is very near that quantity, further work being under way at present to determine this, as well as the maximum amount of infection against which a single injection of vaccine will protect all dogs.

When the virus is injected directly into the brain with a relatively large needle, there necessarily follows a considerable destruction of nerve tissue. This, together with the location, since the rabies virus shows a peculiar affinity for nerve tissue, forms an ideal medium in which the virus can multiply.

Apparently the production of symptoms after natural infection depends on the rapidity with which the virus gains entrance to the central nervous system, rather than on the amount, as it is seen from the experiments (e. g., table III) that those animals receiving a small dose succumbed as quickly as those receiving the larger doses. Considering that 0.01 cc of this 1-100 suspension of fixed virus is equivalent to one m. l. d., then the animals in these experiments received from one to 5 to 200 m. l. d.

While all the dogs which received the relatively large amounts of virus were not protected by this single injection of dead-virus vaccine, one can hardly conceive of that amount of infection gaining entrance to the central nervous system under natural conditions, on account of the inhibitory action of the blood, phagocytes, saliva of the bitten dog, and various mechanical inhibitions which might have been present at the time the wound or wounds were inflicted.

From the results obtained in these experiments, we have evidence that a single 5-cc injection of dead-virus vaccine will produce sufficient immunity to protect against ordinary and often-times extraordinary natural infection, and can be recommended as a means of control of rabies in unexposed dogs.

Summary

1. A dead-virus antirabic vaccine, made from the cords and brains of dogs previously infected with fixed virus, is described.

2. The injection of 5 cc of this vaccine subcutaneously into normal dogs causes no noticeable reaction.

3. The immunity produced by the single injection of this dead-virus vaccine will protect dogs against relatively large amounts of intracranial infection.

4. Coupled with proper quarantine measures, the vaccine can be recommended for the control of rabies in dogs.

REFERENCES

[1]Högyes: Ann. de l Inst. Past., ii (1888), p. 133; iii (1889), p. 449.
[2]Semple: Brit. Med. Jour., Sept. 13, 1919, p. 333;Sept. 20, 1919, p. 371.
[3]Cumming: Jour. Inf. Dis., xiv (1914), 1, p. 33.
[4]Umeno, S.. & Doi, Y.: Kitasato Arch. Exp. Med., iv (1921), 2, p. 89. Abst. in Jour. A. V. M. A., lix (1921), n. s. 12 (6), p. 775.
[5]Hata: Jour. Immunology, ix (1924), 3, p. 89.
[6]Kondo: Vet. Med., xix (1924), p. 592.
[7]Eichhorn. A. and Lyon, B. M.: Prophylactic rabies immunization by the one-injection method. Jour. A. V. M. A., lxiv (1924), n. s. 17 (6), p. 690.
[8]Eichhorn, A. and Lyon, B. M.: Prophylactic vaccination of dogs against rabies. Jour. A. V. M. A., lxi (1922), n. s. 14 (1), p. 38.
[9]Reichel, J. and Schneider, J. E.: Rabies vaccine canine. Single dose treatment. Jour. A. V. M. A., lxiii (1923), n. s. 16 (1), p. 83.
[10]Reichel, J.: The control of rabies. Jour. A. V. M. A., lxiv (1924), n. s. 17 (5), p. 616.
[11]Schoening, H. W.: Jour. Agr. Res., xxx (1925), 5, p. 431.
[12]Corwin, G. E.: Amer. Jour. Pub. Health, xiv (1924), 8, p. 688.
[13]Meader, F. M.: Personal communication.

DISCUSSION

DR. F. H. MCNAIR: As city veterinarian, in a community of 70,000 inhabitants, I have been through four epidemics of rabies. I know a little about them. I was interested in Dr. Schlingman's reference to intraocular infection. That is a point that I have long debated in my own mind. I asked Dr. Eichhorn the question two or three years ago, but he could not give me a definite answer as to the possibilities of such an infection. I repeated the question to him last year, and he made the rather emphatic answer that he thought there was no question but that there could occur, under natural conditions, ocular infection from one dog to another. I had one case that I had under observation, there was a strong possibility that the infection did occur in that way. One of the interesting things that I ran up against was that, in one outbreak, my control work was quite hampered by the emphatic statements of certain M. D.s that rabies did not exist, in their minds, and by the attitude of two veterinarians, graduates of reputable colleges, who stated that in twenty or thirty years' practice, neither of them had observed rabies, that we did not have any such disease, and that they did not think any such disease existed, but, nevertheless, one of the dogs died afterwards of rabies. I am wondering if we have anyone in this group who denies the existence of rabies at the present day.

BIRD OF A DOG

Robinson had met an acquaintance and was singing the praises of his dog, which he declared had an amazing sense of smell.

"But why is he pointing now at that man across the road?" asked his friend.

"Go and ask the fellow what his name is," suggested Robinson.

The other did so, and in a few moments returned with the reply. "He says his name is Partridge."

—*Tit Bits.*

RELATION OF THE THORACIC LIMB TO THE THORAX IN THE CASE OF THE HORSE AND OX*

By JAS. D. GROSSMAN

Ohio State University, Columbus, Ohio.

In our search for truth concerning the anatomical landmarks in use, or locating new ones on the bodies of our domestic animals, we find some of our present literature is somewhat misleading.

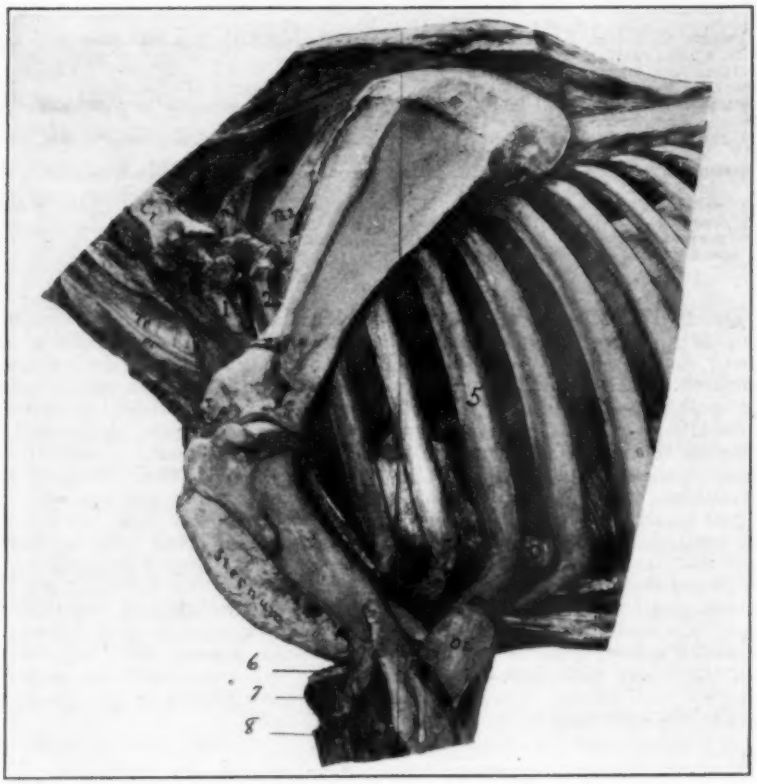

FIG. 1. Dissection of horse, showing position of thoracic limb in normal standing position, the olecranon being in the same transverse plane as the costochrondral junction of the fifth rib, leaving the sixth rib free for palpation behind the point of the olecranon.

C7, seventh cervical vertebra; D, diaphragm; L, left lung; Oe, esophagus; Ol, olecranon; Pericard., pericardium; Sn, Suprascapular nerve; T, tendon of origin of the biceps brachii muscle; Thl, Th2, first and second thoracic vertebrae; Tr, trachea; 1, 2, 5, first, second and fifth ribs; 6, biceps brachii muscle; 7, brachialis muscle; 8, extensor carpi radialis muscle.

This may be due in part to the methods of preparing the specimen or the fact that most of the illustrations are drawings,

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especially the ones dealing with points under consideration in this article.

By the methods of preparation where unembalmed and frozen material was used and drawings were made from it, it is easy to understand why the thoracic viscera are so variously placed as is the case with the illustrations in the older texts; then came the formalin-hardening by intravascular injection, which held the viscera in the more nearly correct position and from which

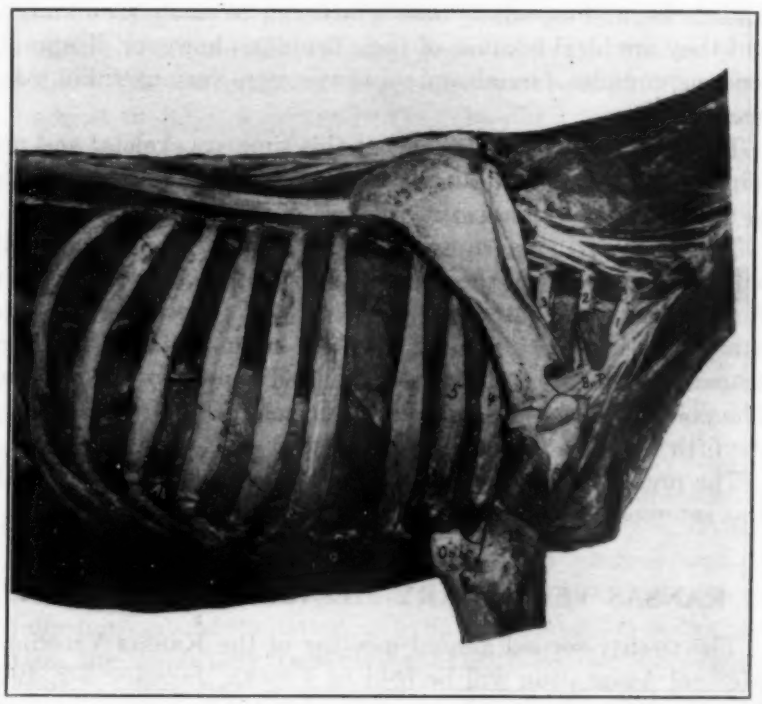

FIG. 2. Dissection of ox showing the position of the thoracic limb in normal standing position. The olecranon being in the same transverse plane as the costo-chondral junction of the fifth rib, leaving the sixth rib free for palpation behind the point of the olecranon.

A, prescapular lymph glands; Ab., abomasum; B, biceps brachii muscle; Br. P., brachial plexus; D, duodenum; Dia., cut edge of diaphragm; G. b. gall bladder; L, liver; Ol., olecranon; Om., omasum; Rt. L. right lung; 1, 2, 3, 4, 5, first to fifth ribs, inclusive; dotted line represents line of pleural reflection from diaphragm onto ribs.

drawings and photographs were made which changed our ideas of the position of the viscera materially.

The use of the X-ray would aid in determining correct position of some of the important features about which we know but little and about which we can expect to learn but little more from the cadaver.

When we think of anatomical landmarks we consider structures which are subject to very little if any change in position and may be located by palpation or inspection and may be safely used in diagnosis or in surgical manipulations. A full knowledge of these structures will enable a practitioner to proceed with a definite technic with a greater sense of confidence and security.

Many structures are easily located and are used for operative procedure and others are useful for locating other parts.

We usually think of skeletal features first, as anatomical landmarks, and especially ones which can be easily seen and felt and they are ideal because of their firmness; however, ligaments, tendons, muscles, fascial septa and veins are very useful in many places.

The ones we wish to consider at this time are skeletal and pertain to the thoracic limb in relation to the thorax first, and later to the position of the viscera within the thorax.

The point of the sternum is a fixed landmark and very easily palpated; the point of the shoulder is above the level of the point of the sternum and lateral to it. What we feel here is the anterior part of the lateral tuberosity of the humerus which in the horse is nearly in the same transverse plane as the point of the sternum. The point of the elbow is opposite the costo-chondral junction of the fifth rib. (See figures 1 and 2.)

The prescapular lymph glands in the ox we find lying over the first intercostal space.

KANSAS VETERINARY MEDICAL ASSOCIATION

The twenty-second annual meeting of the Kansas Veterinary Medical Association will be held in Topeka, January 5-7, 1926. The committee having the arrangement of the program in charge have worked hard and their efforts have been rewarded in the form of a very attractive and well balanced program. An elaborate clinic has been arranged for the afternoon of the second day, consisting of both large and small animal demonstrations and operations. Among the veterinarians from outside of the State who will contribute to the program are Drs. F. F. Brown, A. T. Kinsley, Frank Breed and J. C. Flynn, of Kansas City, Mo.; A. T. Peters, of Peoria, Ill.; H. A. Wilson, of Jefferson City, Mo.; E. L. Quitman and J. V. Lacroix, of Chicago, Ill. Dr. M. P. Ravenel, of the University of Missouri, will deliver an address on "Tuberculosis and Its Relation to Public Health."

THE SIGNIFICANCE OF BACILLUS BRONCHISEPTICUS IN CASES OF CANINE DISTEMPER*

By JOHN G. HARDENBERGH

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The fact that recovery from one attack of true canine distemper confers immunity to the disease is practically indisputable. The reported instances of another attack in the same animal are so rare as to count for little in any practical consideration of the disease. If investigation of these cases were possible, it is likely that most of them would show that the dog's history, as given by the owner, was erroneous or that a diagnostic error had been made somewhere. No one can expect to avoid these errors because of the extreme variability of the manifestations of canine distemper. In the midst of the uncertainty as to the real cause of the disease and the unsatisfactory results in its specific prevention and specific treatment, agreement on the immunity conferred by recovery from an attack is general; moreover, it furnishes a warrantable basis for the expectation that eventually the true cause will be found, and thereby a specific method for prevention and treatment.

The admission of a specific immunity involves the operation of a specific etiologic agent. Whether this agent is a cultivable, visible organism not yet recognized, or an ultramicroscopic, filtrable virus, is still an open question. It probably is not the former but may be the latter, or even a combination of the two. Again, the cause may be some agent such as *Bacillus bronchisepticus*, or even that organism itself, after it has been activated by some substance that may be discovered in further researches in infection and immunity. The reports of Ferry's studies on canine distemper, [1,2,3,4,5] beginning in 1910, made it seem hopeful that a solution of the problem was near. The independent researches of M'Gowan,[6] reported in 1911, and of Torrey and Rahe,[7] reported in 1913, lent considerable strength to this opinion, although none of their results was absolutely conclusive. It is a disappointing sequel that, after fifteen years, the question is still open and that during this time little additional positive

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information has come to light regarding the specific qualities of *Bacillus bronchisepticus*.

To assess the significance of this organism in its relation to distemper is not easy. A review of the work of Ferry, M'Gowan, and Torrey and Rahe, almost forces one to the conclusion that their experiments should have settled the question. It has been in the practical application of their findings that most of the negative evidence has been furnished heretofore regarding the specificity of *Bacillus bronchisepticus*. This same discrepancy between the results obtained by laboratory workers, and those obtained by clinicians or field workers, has occurred in the investigation of more than one infectious disease and makes one wonder why the difference occurs. The present methods of cultivating infective microbes from body tissues are obviously faulty to an extent because the conditions furnished in the test-tube are vastly different from those under which organisms exist in the body. Yet a host of pathogenic organisms has been isolated, cultivated, and shown to retain pathogenic qualities under comparatively crude artificial methods of cultivation.

Possible Reasons for failures of Biologics

On the other hand, it is known that certain pathogenic organisms lose virulence so rapidly that one artificial cultivation is sufficient to render them avirulent for the species of animal originally infected, even though they may retain their virulence for laboratory animals. It is also known that heating, drying, the action of germicides, and so forth, methods necessary in attenuating or killing bacteria in order to render them safe for field use in the form of vaccines or bacterins, may destroy certain heat-labile substances and thus render the antigenic and immunizing properties of the prepration of little value. These things may or may not explain some of the failures that have attended the practical application of the bacterins and antiserums of *Bacillus bronchisepticus* to the treatment of canine distemper.

I began investigating canine distemper four years ago. Certain phases of the work were undertaken, to determine, if possible, the prevalence of infection with *Bacillus bronchisepticus*, its ability to produce distemper and to immunize against the disease. Four methods so far employed will be reported: (1) isolation of *Bacillus bronchisepticus* from dogs affected with distemper; (2) attempts to reproduce the disease in susceptible animals by means of cultures of the organism; (3) the immunizing

and curative properties of bacterins and vaccines, and (4) agglutination reactions of canine serums to determine the extent of infection in immune, non-immune and convalescent dogs.

Isolation of Bacillus Bronchisepticus from Dogs Affected with Distemper

One hundred thirty-nine spontaneous cases of distemper were studied bacteriologically. This number represents but a portion of cases that have come to necropsy, and were selected for bacteriologic examination because the animals either were killed immediately before the examination, or had died but a few hours before and had been promptly refrigerated. Dependable results, especially as regards the presence of secondary invaders, are not to be expected from a bacteriologic study on an animal that has been dead a number of hours, unless the carcass was refrigerated immediately after death. The 139 cases represent all stages of the disease. Cultures were made as a routine from the lower trachea and bronchi, the heart-blood, the lungs, the spleen, and the liver, in glucose-brain-broth tubes or on blood-agar plates, or both. *Bacillus bronchisepticus* was found in some location in ninety-two cases (66 per cent). Table I gives the incidence of the organism in the various organs.

Table I—*Distribution of Bacillus bronchisepticus in the ninety-two cases culturally positive*

Organ Cultured	Number	Per Cent
Lower trachea or large bronchi	81	87.0
Lungs	49	53.2
Spleen	10	10.8
Liver	..	....
Heart blood	..	....

These results differ from those reported by others in two chief respects: first, there was a greater percentage of positive results from cultures of the air passages; second, attempts to isolate *Bacillus bronchisepticus* from the liver and heart-blood invariably failed. M'Gowan also was unable to obtain positive blood cultures, but Ferry reported 28 per cent of these positive, and Torrey and Rahe, 6 per cent.

Again, M'Gowan reported that he found *Bacillus bronchisepticus* in twenty-seven of twenty-nine dogs examined (93 per cent); and Torrey and Rahe in sixty-five of eighty (81 per cent). Ferry did not give his percentage of positive results, but asserted

that he had isolated the organism from ninety-seven animals. In the present study, the organism was found in ninety-two of 139 animals (66 per cent).

Such marked discrepancies in results have been explained by some on the basis of difference in methods. However, in view of the fact that *Bacillus bronchisepticus* grows quite readily on various ordinary mediums, it should be quite as reasonable to explain the differences in positive results by the differences in the number of animals examined in the various series, all of which were relatively small. Percentages in small series of cases are notoriously misleading, and a few positive or negative figures more or less in one column may make a big difference in the percentage results in another. Just as reasonable, too, may be the idea that *Bacillus bronchisepticus* is not equally prevalent in all outbreaks of distemper; certainly no one so far has demonstrated that it is present in all cases or that it must be present in order to establish *prima facie* evidence for a diagnosis of distemper

The cases examined were selected only for their fitness bacteriologically. They were ordinary, spontaneous types of distemper in various stages, and the dogs were taken from stock pens where most forms of distemper infection are present and where new distemper infection is being introduced continually. Such conditions, it is believed, should give a fair idea of the prevalence of *Bacillus bronchisepticus* in the disease.

Attempts to Produce Distemper with Bacillus Bronchisepticus

Early in 1922, Dr. S. D. Brimhall and I undertook an experiment to produce distemper in a series of young, susceptible dogs. Six Collie puppies, four months old and from the same litter, were used. They had not been exposed to distemper previously and were confined in quarters removed from the kennels. Two were infected with a freshly isolated strain of *Bacillus bronchisepticus*, one receiving 0.5 cc of a twenty-four-hour broth culture intranasally, the other a like amount intratracheally. The second pair was infected in the same manner but with a mixture of cultures from animals affected with distemper, consisting of *Bacillus bronchisepticus*, streptococci, staphylococci and *Bacillus coli*. The third pair was reserved as controls. Each pair was isolated from the others during the experiment. Table II gives the results of the experiment.

TABLE II—*Experimental production of distemper*

DATE 1922	ANIMAL	MATERIAL	AMOUNT (CC)	GIVEN	SYMPTOMS
1–25	F93	*Bacillus bronchisepticus*	0.5	Intranasally	Ill 10th day after injection; died 25 days after
1–25	F94	*Bacillus bronchisepticus*	0.5	Intratracheally	Remained well for 3 weeks. Placed in kennels; contracted distemper after 10 days; recovered
1–25	F95	*Bacillus bronchisepticus*, streptococci, staphylococci, *Bacillus coli*	0.5	Intranasally	Remained well for 3 weeks. Placed in kennels; contracted distemper after 18 days; died in 1 week
1–25	F96	*Bacillus bronchisepticus*, streptococci, staphylococci, *Bacillus coli*	0.5	Intratracheally	Ill 10th day after infection; died 23 days after
1–25	F97	Control			Remained well for 3 weeks. Placed in kennels; contracted distemper after 1 week; recovered
1–25	F98	Control			Ill 8th day; died 19 days after

This experiment was of little value because one of the control animals contracted distemper (source of infection not known) and died before either of the injected animals. The latter two presumably succumbed to the experimental infection, although of this I am not certain. The fact remains that the two injected animals that did not contract distemper during what was considered a reasonable incubation time, and one control animal did become ill after being placed in contact with the natural infection. The difficulty of controlling such experiments, so as to preclude all chance of accidental exposure, is well recognized. Without such precautions, experiments in artificial infection can have little value, and conclusions can be based only on the bulk of evidence presented by a fairly large number of tests.

Since the time this first trial infection was made, it has not been found feasible to attempt similar trials under conditions that would guarantee absolutely against accidental infection. The physical requirements of such an experiment alone are stupendous, as is demonstrated by the elaborate system of isolation quarters being used by the British Distemper Research Committee in their studies in England. However, I have inoculated at odd

times several groups of puppies, of various ages after weaning, with a view to determining the consistent production of distemper by *Bacillus bronchisepticus*. All of these animals had been raised on farms, had never been exposed to distemper so far as was known, and were consequently considered susceptible subjects.

In no group did I produce distemper in a majority of the injected animals; some of the positive cases credited to *Bacillus bronchisepticus* were doubtful, and in several instances I had the experience of seeing some of the animals succumb to natural infection after recovery from our accredited experimental attacks that had shown at least some of the ear-marks of distemper, such as inappetence, cough, and fever. In fact, a majority of the animals used in these inoculation experiments, the injected as well as the control animals, contracted unmistakable distemper in the kennels from natural exposure after they had passed through a long enough incubation period for the artificial infection to take effect. I am therefore convinced that there is something questionable about the primary etiologic significance of *Bacillus bronchisepticus*, at least under present methods of investigation.

Immunization Experiments

In every laboratory where any considerable amount of research in medical problems is undertaken, dogs are the experiment animal of choice. To every such laboratory, canine distemper is a problem of first importance. Animals for use in prolonged experiments, especially, and also in many short experiments, must be immune to distemper; otherwise there is a grave chance that the results of weeks or months of painstaking labor will be lost in a few days. As a result, and because of the general problem of prevention of, or at least immunization to, distemper in our animals, attention was early directed to this phase of the work. The problem has been solved but not through the agency of artificial protection. Rather, it has been by means of natural infection. In other words, all unused animals are allowed to contract the disease if they are not already immune. The losses, such as they may be, are taken while the animals are still unused and of comparatively little value, and the really immune dogs that have recovered are then furnished to the laboratory.

It can be said without reservation that no thought or worry is given to the problem of possible second attacks, no matter what the exposure, after the animal has once passed through

the natural distemper. This is an excellent system for research laboratories to operate on, but there is nothing of value in it for the practitioner of veterinary medicine, nor of comfort for the owners of dogs except the fact of definite immunity. Before the present system was adopted, preventive and curative inoculations were attempted on a large scale. Again, it should be stated that our conditions are not ideal for the successful operation of such a program of inoculation, for the reason that the new animals are usually exposed to the disease soon after their arrival in the kennels. However, the rationale for the effort of carrying on work with bacterins and vaccines was based not only on the possibility of prevention of distemper in a certain number of susceptible animals, but also on the curative value that had been ascribed to certain inoculations with *Bacillus bronchisepticus*. In speaking of protective and curative inoculations, Ferry[5] said, "Experiments conducted the past two or three years have shown that about sixty to seventy per cent of distemper dogs may be saved, providing the vaccine (living) is given early in the disease, and the cases are as carefully handled as they would be without the treatment."

Medical Treatment of Distemper

My medical treatment of distemper has never been intensive and has, of necessity, been of a fixed character because of the considerable number of animals concerned. In spite of this, the mortality from distemper in the kennels of the Mayo Clinic has never been excessive; in fact it has been much less than might be expected, and I believe it compares favorably with that met with in private practice. Doubtless, this is largely because very few highly-bred animals are dealt with; the types which are most common are those which can be expected to have the greatest resistance not only to distemper, but to other infections.

Early in the work, commercial products, mostly based on *Bacillus bronchisepticus*, were used in a considerable number of dogs. The results were either negative or so slight as not to justify their use as a routine. Later on, I decided to prepare my own bacterins and vaccines for further trials. A mixed bacterin was prepared from several strains of *Bacillus bronchisepticus* secured elsewhere and other strains that had been isolated in the laboratories. It also contained streptococci, staphylococci, and *Bacillus coli*, all obtained from dogs affected with distemper. A living vaccine was made containing *Bacillus bronchisepticus*

only, which was attenuated in no respect other than by artificial cultivation on nutrient agar. These products were made up to contain about 500,000,000 organisms for each cubic centimeter and were employed in similar dosage.

Beginning in the latter part of 1921, most of the new dogs were inoculated subcutaneously on their arrival with the first dose (1 cc) of either the bacterin or the living vaccine. One week later, they received a second dose (2 cc) of the same product, followed in another week by the third dose (2 cc). This schedule was carried on until 493 dogs had been treated, about half receiving the bacterin and half being inoculated with the living vaccine. A smaller number of dogs (about 175), that had come to the kennels in small shipments and at irregular intervals, were not injected, and they helped to serve as controls. At the end of the experiment it was found that no appreciable change had occurred either in the incidence of the disease or in the mortality among the treated animals, and the only inferences that could be drawn were: that the subcutaneous inoculation of living vaccines of *Bacillus bronchisepticus* are harmless, and that, under the conditions of the experiment, bacterins and vaccines composed principally of *Bacillus bronchispeticus* are of no apparent value. The former fact has been observed by others.[5]

Agglutination Tests to Determine the Extent of Reaction to Bacillus Bronchisepticus Antigens in Immune, Susceptible and Convalescent Dogs

Ferry, M'Gowan, and Torrey and Rahe paid considerable attention to the serologic reactions obtained with canine serums and *Bacillus bronchisepticus* antigens. Most of their work was with the agglutination test and it was generally agreed that the reaction was specific and that serum from dogs not having had distemper gave negative results to the test.

It should be noted that the reactions obtained by these investigators do not seem to be as specific as they should be, considering the specific qualities that were credited to *Bacillus bronchisepticus* as the primary agent in distemper. This may be due to the so-called slight power of forming agglutinins which the organism is said to have.

In my agglutination tests, five strains of *Bacillus bronchisepticus* from outside sources and three that I had isolated were used in preparing the agglutinating antigens. Some difficulty was

experienced in selecting the strains because a large number of serums had to be tested against various antigens before any were found which had a sufficiently high agglutination-titer to be considered suitable for testing out these strains. Three serums were finally selected as positive controls, but the highest dilution in which a reaction was produced was one of 1:200 only, and the reaction was only partial in that.

Preparation of Bacillus Bronchisepticus Agglutinating Antigen

Eight Kolle flasks of glycerin agar were inoculated with the eight strains of *Bacillus bronshisepticus* and incubated for from twenty-four to forty-eight hours. The growth, always abundant, was washed off in 10 cc of sterile physiologic solution of sodium chlorid, the washings from the various flasks mixed, and the mixture heated at 60° C. for two hours. Sufficient salt solution, containing 0.5 per cent phenol, was then added to bring the preparation to about the proper density and it was then agitated on a shaking-machine for thirty minutes. The antigen was then placed in the ice-box for one week to allow any sedimentation to take place. At the end of this time, the supernatant fluid was drawn off and diluted with phenolized salt solution to a standard for the agglutination tests.

Collection of serums with a Luer syringe: Ten cubic centimeters of blood was drawn from the jugular vein of each dog to be tested. The blood was transferred to tubes, slanted to facilitate the separation of serum, and allowed to clot firmly. The samples were then placed in the ice-box over night and were tested the following morning.

Technic of the test: For the routine test, four dilutions of serum were used: 1:20, 1:50, 1:100 and 1:200. This gave sufficient range for preliminary examinations, it being planned to retest in higher dilutions any serum which showed complete agglutination in all tubes. So far, it has not been necessary to retest any samples. The usual technic for agglutination tests was adapted to the use of the ordinary Wassermann tubes (75 by 11 mm.), thus effecting a saving in antigen and in incubator space when a considerable number of samples were being tested at one time.

Four tubes were set up for each sample of serum to be tested, in racks holding nine sets of tubes; 0.05, 0.02, 0.01 and 0.005 cc of serum was placed in the four tubes, respectively, which, on the addition of 1 cc of antigen, gave dilutions of 1:20, 1:50,

1:100 and 1:200, respectively. The serum was delivered into the bottoms of the tubes in each instance so as to avoid the errors that might arise from serum drying on the sides of the tubes, if allowed to run down the sides of the latter. After 1 cc of antigen had been added to the tubes, the racks were well shaken to mix the contents thoroughly but not so vigorously as to form bubbles. They were then incubated at 37.5° C. for forty-eight hours. This time was allowed to insure all possible agglutination, although it was noted that usually no further agglutination occurred after twenty-four hours. Readings were made on a basis of 4+ for complete agglutination.

Serum was collected from three classes of dogs: animals known to be immune to distemper and which had been immune for at least two months; animals definitely convalescent from distemper, and animals that had not been exposed to distemper infection so far as could be ascertained.

The results of the tests that have been applied are given in table III. Note is made only of those reactions which represent complete agglutination in any given dilution, which is believed to be a fair method of comparison. Figures relative to partial agglutinations convey nothing regarding the specificity of the reactions obtained.

TABLE III—*Results of agglutination tests with Bacillus bronchisepticus antigens*

SERUM FROM	NUMBER TESTED	COMPLETE AGGLUTINATION IN DILUTION OF				NO AGGLUTINATION IN LOWEST DILUTION
		1:20	1:50	1:100	1:200	
Immune dogs....	344	270	60	4		74
Convalescent dogs	22	4				18
Unexposed dogs..	52	28				24

Of 344 immune animals tested, 270 (78 per cent) gave complete agglutination in a dilution of 1:20 or higher, and seventy-four (22 per cent) gave no agglutination whatever. Of the 270 serums which were positive in 1:20, only sixty (22 per cent) agglutinated at 1:50, and four (1.5 per cent) agglutinated in 1:100 dilution. No serum has been encountered that gave complete agglutination in a 1:200 dilution.

Of the convalescent dogs, only 18 per cent showed any agglutination. This is in accord with results of other investigators.

Of fifty-two dogs that had not been exposed to distemper, so far as was known, twenty-eight (54 per cent) showed agglutina-

tion, but in the 1:20 dilution only. This is not surprising, because a non-specific reaction in such low dilutions is encountered in agglutination tests with other organisms. All that can be inferred from these tests is that the reactions of the various classes of dogs are not as specific as might be expected from the very specific nature of the natural infection.

Discussion

Bacillus bronchisepticus is the most constant invader so far isolated in cases of canine distemper and is most frequently encountered in the air passages. The organism cannot be demonstrated in all cases of the disease, and the differences in the positive results obtained by various investigators are open to the explanation, among others, that *Bacillus bronchisepticus* is not equally prevalent in all outbreaks.

True canine distemper cannot be produced consistently in susceptible animals by means of *Bacillus bronchisepticus* and by methods commonly employed in such infection procedures. The best result reported thus far by any investigator has been to produce the disease in only slightly more than 50 per cent; and there is still some question of the identity of actual distemper and the train of symptoms shown by the artificially infected animals. Undoubtedly, *Bacillus bronchisepticus* has certain pathogenic properties, but it exhibits negative properties as compared with the positive characteristics of natural distemper. These negative properties are shown (1) by its failure to produce definite distemper in most of the susceptible subjects, (2) by the very slight agglutinating properties imparted to the blood-serum of dogs immune to distemper (it being presumed, and capable of proof, that a majority of these animals had harbored the organism), and (3) by the comparatively slight protection afforded by vaccination with the organism.

I am unable to agree with the previous investigators concerning the protection afforded dogs against natural distemper by *Bacillus bronchisepticus* bacterins and vaccines, and the immunity to the natural infection manifested by animals after recovery from an experimentally induced attack of the disease. It may be possible that such animals will withstand a casual exposure to distemper, but they certainly will not, in the light of my experiments, withstand prolonged exposure to highly virulent infection.

The reports of results obtained in private practice with biologic products available for use in canine distemper are very conflicting. Few extravagant claims are being made as regards the specificity of these products. It would seem desirable to get an expression of opinion from a representative group of men who are qualified to pass on the results to be expected from the use of the available biologics. With a disease such as distemper, with mortality high and sequelae common, one should use any available means in an effort to protect susceptible animals or to bring about the recovery of the infected. In this sense, the use of biologics based on *Bacillus bronchisepticus* is justified in the same way as that of other relatively non-specific agents, provided not too much is expected by the client or claimed by the practitioner. In the light of present knowledge, it would seem best to do all that is humanly possible while keeping our minds free from any ill-founded idea regarding the specificity of the agents employed.

REFERENCES

[1]Ferry, N. S.: Preliminary report of the bacterial findings in canine distemper. Amer. Vet. Rev., xxxvii (1910), p. 499.
[2]Ferry, N. S.: Etiology of canine distemper. Jour. Inf. Dis., viii (1911), pp. 399-420.
[3]Ferry, N. S.: Further studies on *Bacillus bronchicanis;* the cause of canine distemper. Amer. Vet. Rev., xli (1912), pp. 77-79.
[4]Ferry, N. S.: *Bacillus bronchisepticus (bronchicanis);* the cause of distemper in dogs and a similar disease in other animals. Vet. Jour., lxviii (1912), pp. 376-391.
[5]Ferry, N. S.: *Bacillus bronchisepticus;* its relation to canine distemper. Amer. Vet. Rev., xliii (1913), pp. 16-30.
[6]M'Gowan, J. P.: Some observations on a laboratory epidemic, principally among dogs and cats, in which the animals affected presented the symptoms of the disease called "distemper." Jour. Path. & Bact., xv (1911), pp. 372-426.
[7]Torrey, J. C., & Rahe, A. H.: Studies in canine distemper. Jour. Med. Res., xxvii (1913), pp. 291-364.

MISSOURI VETERINARIANS TO MEET

The Missouri Veterinary Medical Association will cooperate with the Division of Veterinary Science of the University of Missouri in putting on a short course for graduate veterinarians, at Columbia, Mo., December 28-31, 1925.

Dr. John W. Adams, president of the American Veterinary Medical Association, will deliver the opening address. Dr. A. T. Kinsley will be in charge of the swine section. Dr. Sivert Eriksen will have charge of the poultry section. Dr. Frederick R. Whipple of Peoria, Ill., will direct the small animal section. Dr. E. T. Hallman, of Michigan State College, will be in charge of the cattle section.

The course will be free to all members of the Association in good standing, and open to all other graduate veterinarians upon payment of a fee of ten dollars.

THE VETERINARIAN, SOCIETY AND THE COLLEGE*

By E. E. WEGNER, *Pullman, Wash.*

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There is at present an unsettled opinion concerning the present usefulness and future possibilities of the profession of veterinary medicine. That uncertainty regarding the usefulness and future of this profession does exist is evidenced by the fact that at the present time young people hesitate to enter the veterinary colleges to prepare themselves for this field of work. To me this cannot be interpreted as an expression of public confidence in the future possibilities of veterinary medicine.

If this were not enough to prompt the preparation of this article the opinions expressed by some of the men in the profession would be reason enough. In recent issues of some of the veterinary medical journals it is found that practitioners and others have expressed some doubt regarding the future of their profession.

Without reciting history to prove my contention, it seems perfectly plain to me that veterinary medicine at the present time is searching diligently for a stable place in the affairs of our economic structure. Veterinary medicine is comparatively young and only within the last few years has it risen to liberal heights of development and prepared itself to assume the responsibilities of a great profession. Numerically, veterinary medicine is represented by a small number of individuals, as there are, at the present time, about six dentists and approximately eighteen physicians for every qualified veterinarian. With this limited number of men to represent it and its rapid development, it is evident that it cannot be as well known to the public as the other professions. With the affairs then as they are at present, a limited number of qualified men representing it and a public that does not know of its possibilities and with a few doubting men in the profession itself, is it any wonder that veterinary medicine is not more firmly established in our social structure?

It seems to me that there is no question but that as time goes on, veterinary medicine will gravitate to a permanent place in the affairs of mankind and occupy a position as substantial as engineering, law, human medicine, pharmacy or chemistry, but

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the time has not yet come when this solidity of position is established and, like the others, its future success and position will depend entirely upon its usefulness and merits.

Has veterinary medicine something sound, enduring and useful to offer as an excuse for its existence and support?

Veterinary medicine does not yet fully realize the limits of its possibilities. As we look back over the past, we note that in the beginning the veterinarian ministered to the sick animal and that constituted the entire sphere of his usefulness. From that humble beginning we have seen a profession develop and unfold its possibilities to an extent that the early pioneers in the profession would have deemed impossible. From ministering to the sick animal, disease prevention followed and sanitation took an important place in the affairs of the veterinarian and today, by this feature alone, animal health is being protected from the invasion of diseases from abroad, contagious diseases are being suppressed among the live stock of this country, diseases that are transmissible from animals to men are being brought under control and not only animal health but human health as well is being protected.

The fundamental knowledge upon which this essential work is based is not unlike that of human medicine and must include a thorough knowledge of disease and its causes, because, without the knowledge of the causative agents of disease, suppression is impossible. The veterinarians have taken an important part in the study and determination and means of control of many of the diseases affecting our animals and in many instances these facts have been of great service to the work in human medicine. Veterinary medicine has not followed in the foot-steps of any profession. It is true that much of our present useful knowledge has been obtained from investigators in human medicine, but in its turn veterinary medicine has repaid much that it has borrowed. It seems certain to me that an independent profession that can serve many useful purposes will certainly make for itself an enduring place in our civilization.

Opportunities for Service

When we look about us and see the many fields of usefulness into which veterinarians are projecting themselves, we become impressed with the fact that what others can do we may do also and it should be the means of suggesting to us, as a profession, various useful enterprises that might well be featured as the

occasion arises. All are familiar with the trend of the affairs of the practitioner in the past decade. Formerly his field of usefulness was limited to treating diseases of the horse, but from that animal his attention was forcibly directed to the treatment of diseases of cattle, swine, sheep, small animals and poultry. Yet how many men in the profession are using their best efforts to prepare themselves to handle these additional responsibilities?

The field of sanitation, including the suppression of such diseases as tuberculosis, sheep scab, cattle scab, hog cholera, dourine, foot-and-mouth disease, and others, has occupied the attention of a large number of men of our profession. The inspection of animal food products—meat and milk—is an important field of service and one that many veterinarians can develop with advantage to themselves, both financially and socially. The Quartermasters' Corps in the army has developed this field of service to a high state of efficiency and we are proud to know that all food products of animal origin must be passed upon by veterinarians before they are deemed fit to be issued to our troops. The field of disease suppression rightfully includes the work of the immunologist, and here veterinarians have found a new service in the perfection and manufacture of curative and preventive biological products.

In addition many are giving their attention to the preparation of veterinary medicines in more convenient form for administration. Others by reason of their highly specialized training and experience are taking the lead in the work of practical animal nutrition. Any of these different fields of endeavor is capable of supplying a man with material for thought and study but, taken collectively, they present a field of such magnitude and so complex that they challenge the brains of the best man of our nation for solution. Development along these particular lines has only started and the possibilities for the future is unlimited. Are we justified, then, in our doubts concerning the enduring qualities of our profession?

Remuneration

The service of the veterinarian is a commodity with economic value and it can never exceed nor approach the commercial value of an animal. This precludes the possibility of ever developing a high scale of fees, but it is a fact that most of our sister professions are supported by fees of a similar kind. It is more satisfactory to have a business established on the basis of many

small sales with a certain but reasonable profit in each one than to depend upon a few, large-profit transactions. Our charges must necessarily be in such amounts as will show a profit to the owner and to the veterinarian as well. We need to develop in the minds of our clients a knowledge that an investment in veterinary service is profitable. Otherwise, the profession cannot survive. There is much veterinary work in all of our localities that is being neglected, when both the owner and practitioner could profit by having it done. We need to be better known to our clients and our clients need to be made to realize that they are losing money and profit by not employing their veterinarians more frequently.

Advertisements

This brings us face to face with the question of how to present ourselves fairly and legitimately before the public and to make them appreciate that the veterinarians have useful knowledge that would benefit mankind. Professional ethics, when not overdone, are to be respected, but it is my opinion that the veterinarians have not presented themselves as effectively as they might legitimately have done. Is it fair to the public and to the practitioner to withhold the facts that advanced scientific knowledge possessed by the practitioner is now capable of successfully controlling certain diseases that formerly were uncontrollable?

Many people do not know that rabies vaccination is practical, that hog cholera vaccination is upon a substantial scientific basis, that our knowledge of the treatment of certain parasites has vastly increased within the last few years and many other instances might be cited where very considerable advancements have been made. Would it not be proper and fair to advise our clients directly that our knowledge of these conditions is practical and at their disposal? Or should we do as we have done in the past—keep these things to ourselves for so-called professional reasons and permit our clients to gain inaccurate information in an indirect way? I believe it is perfectly proper for a man to keep his clients advised of the many advances and perfections in veterinary medicine and to point out to them, from time to time, the seasonal dangers to their live stock and to suggest means of prevention and the possibility of successful treatment.

Many stock owners do not know that a hard milker can be operated on with success, that blackleg vaccination is practical

on every farm in many localities, that certain breeding difficulties can be profitably treated and there are scores of other useful treatments that might legitimately be called to the attention of stock owners. There are many farms in every veterinarian's territory that have never been visited and there are many individual cases on other farms that could be treated with profit to both owner and veterinarian, if the owner only knew it.

Ethically, we have tried to follow our older sister profession, and in that we have made some mistakes, because veterinary medicine is a commercial proposition and the veterinarian must show the owner a profit if his services are to be used. Why not then enlighten the owner directly and show him how he can profitably use this profession to advantage? Certainly such a program of education or enlightenment is not a crime, when the public has such a distorted opinion of us. We make sport of the man who still believes in "hollow horn" and "wolf in the tail." Why not let this man know that we have practical knowledge of animal diseases far in advance of his present ideas? If we do not do it, who is going to? I feel that we are still in the "hollow horn" age as regards methods of promoting our own interests. How are we to market our hard-earned knowledge if we make it a secret that we have it? What the veterinarian needs is a course in legitimate, commercial salesmanship.

Specialties

In a field of medicine as broad and complicated as veterinary medicine has grown to be, it is evident that it is quite impossible for any man to become highly specialized in all of its different fields, and while a decade ago it would have been considered unsound reasoning to talk of specialties in veterinary medicine, these have developed unconsciously in our profession and today it is a common thing to find men giving their whole time or most of their time to the consideration of special features. This is best exemplified by pointing out such fields as bovine medicine, small animal practice, poultry medicine, biological manufacture, food inspection, commercial pharmaceutical manufacture, disease investigation and the like.

It has been called to my attention that men of the profession often realize the advantages and possibilities of special service but lack the essential knowledge of just how to organize and develop these various special fields and it is at this point that the colleges might possibly be of greater service to the veterinary profession

than they are at present. Human medicine is so organized that anyone in it can secure additional training along any special line that he may care to pursue, but as yet there is not a corresponding development in the educational system for veterinarians. Our present system includes a very comprehensive course of instruction in the principles of veterinary medicine, and with this training many of our men have been able to place themselves in the special fields by their own individual efforts. However, all men do not possess these happy personal qualifications and need to have additional specialized training in certain kinds of work.

The army, when it needs men for food inspectors, takes its veterinarians and schools them for several months before finally assigning them to duty and it would be a step forward if our educational system made provision for giving special post-graduate training along such lines as municipal sanitation, inspection of animal food products, state sanitation, and in the treatment of diseases of individual species of animals, such as cattle, small animals, poultry, etc. I will grant that in the past many men have successfully invaded these fields after having secured the knowledge contained in our basic college courses, but I believe our institutions of learning would be of greater assistance to the men of the profession if they could find it possible to provide additional instruction along the line of the special actitivies that the veterinarians are now seeking to enter.

Enrollment and Future

At present the enrollment in our colleges is far below that of a decade ago. While we have lost numerically we have made a very distinct gain educationally, and the men going out of the colleges today will create a more favorable impression upon the public than some of the men with their limited advantages of bygone days. Our graduates of today are the men who will mold public opinion of the future. They are the kind of men who are capable of taking their places among the men of other professions and they will reflect credit upon the profession that they represent. As matters stand at present, it is impossible to interest young men in the veterinary profession because the public generally does not understand or know about the present high educational standards and the many fields of usefulness to which a veterinary education can be put. Education of the public is a slow and tedious process and years will be required to make this change in public sentiment and it wi'l have to come about by

observation of the veterinarian himself, his qualifications, and his activities.

Profession Numerically Smaller

Where veterinary medicine is represented in a community by men of high standards, the profession is well thought of, but in the numerous districts where service is entirely lacking or where the profession is represented by poorly qualified men it has not risen far above its plane of twenty years ago. At the present time veterinary medicine is losing numerically. The losses within the profession from such natural causes as death, retirement, and change of occupation, are greater than the additions from the graduating classes of our colleges. I believe that our present numbers are not too great and that there is danger of permitting the number of competent men to become too small. Such a condition invites the development of the quack and the imposter —a condition that we have been striving to overcome for many years. I believe it to be in the interest of every man in the profession to keep our present numerical standard or to increase it somewhat. I would not like to see our colleges crowded and graduates by the thousand liberated each year, but I do believe that we ought to have at least double the present number to maintain the present numerical standard and to supply the demand for veterinarians that will develop when the usefulness of the profession has become apparent to a greater percentage of our people.

We also need a larger freshman enrollment to provide an opportunity to cull more closely in the first year or two of our college courses. I wish that the veterinarians of the country might pick the students that are to take up the work in our colleges. Every man in the profession has an opportunity to observe the boys of the graduating classes of our high schools and when a particularly well-fitted boy is observed it would be proper for the veterinarian to advise him fully of the opportunities presented by veterinary medicine. If the men in this profession would send one hand-picked high school boy to some veterinary college only once every twenty years, that movement alone would more than double our present freshman enrollment. Is it too much to expect each one of us to pick out two or three boys in our life time and encourage them to take up this specialized work? Such a movement would supply our colleges with a substantial number of hand-picked men of unusual ability to

train to take up the future burdens in veterinary medicine. Such a plan would provide ample assurance for the success of the profession in the future.

Conclusion

In conclusion I would like to say that the veterinary profession is just now finding a substantial place in the affairs of our civilization. There is no doubt in my mind but what this place will be just as essential and enduring as the places now occupied by some of the older and better-known professions. Our future will be judged by the character and abilities of the men who represent it. We are all anxious that the future of the profession be one that is recognized by the public and one that commands their admiration and respect. To a considerable degree it is within our power to mold the destinies of the future. It is not hard to visualize the freshmen in the colleges today, manning this Association tomorrow and manning the affairs of the great profession that this Association represents. So, while you have opportunity, consider thoroughly how each one can help to enhance the usefulness of veterinary medicine, to suggest means for improving our present educatioual facilities and then help us to select from the high schools the right kind of material to take up the burdens of tomorrow. Such a program will insure a substantial and enduring place for the profession of veterinary medicine.

Discussion

Dr. N. S. Mayo: This is one of the best expositions of the present situation that I have heard. It seems to me that the paper brings out that the condition that affects our profession at the present time is due to several causes. Some things Doctor Wegner mentions; particularly the economic conditions following the war; psychology to a certain extent, and especially to the changed conditions of veterinary practice.

We have in this country a large number of veterinarians who were trained in years gone by, when horse practice was the principal thing. Now the veterinarian must be trained to be a general advisor to the live stock grower regarding all problems connected with the growing, handling, feeding and care of live stock. Many of us of a generation ago did not get that training. Situated as I am, I have an unusual opportunity for noting some of the weaknesses of our profession. I believe, however, that the veterinarians who are now being trained in our colleges will take their places in the changed conditions of the future and will fulfill the expectations and the opportunities that develop in this country.

There is no country in the world, I think, where the veterinarian is more highly thought of by the people generally than in this country and that is because we have one of the greatest live stock industries in the world. The present status of the veterinarian is changing rapidly.

One of the influences that have affected the profession in this country very beneficially, I think, has been the work of the Bureau of Animal Industry. I do not think there is any one factor that has had more of an influence in placing the profession on such a high plane as the Bureau of Animal Industry and the efficient work it has done. Another factor at the present time is the Army Veterinary Service. Most of you can remember when conditions were

such that well-trained veterinarians were not attracted by the army service. Now the army is getting a high class of young veterinary officers who are rendering excellent service.

There are other favorable conditions, but I believe that the outlook for the future of the profession in this country is unusually good. If I was starting again, I certainly should not hesitate to start right now in this period of depression. We have had them in the past; we will have them again in the future, but I believe that at least for the near future one can look at it with optimism.

DR. C. H. SEAGRAVES: Dr. Wegner, I would like to ask you what things you would look for in a young man whom you would select for veterinary instruction? A student who has had honors bestowed upon him in a city, or a student who was more appreciative of farm conditions?

DR. WEGNER: I think we all size a man up about the same way. I would like to look at him first. He needs to be a real boy, a boy with some intelligence and above all he must be a boy who is interested. He should be interested in veterinary medicine and everything that goes with it. I would like also to see him interested in agriculture and the handling and protection of animals. It is only a short step to medicine if he is interested in handling animals. Above all, he must be a good, clean-cut fellow. That is the kind of men the profession needs to command the respect of the people—a fellow who is energetic. If he has had experience with animals, that is of tremendous assistance. We have had some of the city boys, who have gone to city high schools, who have majored in Latin and then come down and wanted to take veterinary medicine. That kind of a man is a poor prospect. If I can get a boy from the farm with the above qualifications I would rather have him.

COLLEGE NOTES

The Marilla Griswold Scholarship at the Michigan State College has been awarded to Mr. Floyd Young, a freshman veterinary student. This scholarship consists of the income from a bequest of $2000.00 which the College received by the will of Marilla Griswold, of Allegan, Mich., several years ago.

The Veterinary Faculty Prize, of $25.00, was awarded this fall to Mr. Floyd Darst, of Abingdon, Ill., the veterinary student having the best scholastic record for the freshman year at Michigan State College.

Dean Moore reports that there are 21 senior veterinary students at the Cornell University instead of 20 as reported in the summary of veterinary students published in the November issue of the JOURNAL, one senior having been omitted through error in compilation.

Dean Giltner reports the acquisition of two additional veterinary students at Michigan State College, one freshman by transfer from the Science Division, and one sophomore by similar transfer.

The name of the Department of Veterinary Science of the Virginia Polytechnic Institute has been changed to the Department of Zoology and Animal Pathology, through the addition of zoology to the Department, according to Dr. I. D. Wilson.

EXPERIMENTS IN METALLURGICAL POISONING OF ANIMALS AT OROYA, PERU, AT AN ELEVATION OF 12,200 FEET*

By JAMES F. MITCHELL

Cerro de Pasco Copper Corporation, Oroya, Peru

In submitting this paper, I wish to state that the work here described is principally of local interest. The tolerance of animals for metallurgical poisons has been worked out in other countries, at lesser altitudes, more or less completely, but the effect of an altitude of 12,200 feet has never, to my knowledge, been gone into. We all know that arsenic has been used as a stimulant by mountain people for hundreds of years, with results sufficiently enlivening to keep the practice in existence.

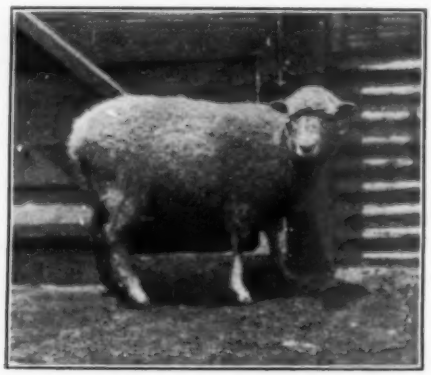

FIG. 1. Sheep 1506 from pen 1, just before being killed, Sept. 13, 1924. Had eaten 4.279 grams of arsenic trioxid.

Many of us have heard the story of the doctor who, after giving an arsenic eater a piece the size of a pea, was asked for a second dose, instead of having the pleasure of holding a postmortem. Be that as it may, it has been known for many years that man can build up a great tolerance for arsenic. The tolerance of the human body for lead, as compared with arsenic, is slight, but the amount of lead that it takes to produce the symptoms of lead poisoning is usually much underrated. Flue dust, as put out by the Oroya smelter, is largely a mixture of arsenic and lead, so far as the main poisonous elements are concerned.

*Presented at the Third Pan-American Scientific Congress, Lima, Peru, Dec. 20, 1924-Jan. 6, 1925.

I went to Oroya on March 28, 1924. On my arrival, I found certain experiments started in feeding the arsenic, lead oxid, and flue dust, both to sheep and cattle. These experiments were run with two main ideas in view. The first was to ascertain, as far as is possible with so few animals, the effect of altitude (12,200 feet) on the tolerance of cattle and sheep for arsenic, lead oxid, and flue dust. The second (and the more important) was to try to produce renguera in sheep by feeding arsenic, lead oxid, and flue dust.

Fig. 2. Sheep 1509, killed, Sept. 13, 1924. Had eaten 25.443 grams of lead oxid.

The experiments, so far as tolerance for these metals is concerned, were carried out to the end in cattle. In sheep, we never actually killed an animal, although we fed them a good many grams of these metals. Another thing that should be noted is that all these experiments were carried on in the corrals at Oroya, where smoke from the smelter was almost constantly dropping on the feed. This certainly increased the amount of poisons taken in by the animals. The weighing of these animals and the taking of manure samples did not commence until after my arrival.

The amount of arsenic and lead eliminated is calculated from the analysis of these manure samples only, no other source of elimination being taken into account. The necessary manipulations for getting urine samples cannot be carried out by inexperienced handlers without infecting animals; I personally could not always take these samples. Another thing that must be borne in mind is that the Cerro de Pasco laboratory, at Oroya, being a metallurgical laboratory where great numbers of ore samples are analyzed, and located in a smoke area, tends to get a high analysis of metal contents, due to contaminations.

Sheep Experiments

Pen 1: Pen 1 was fed arsenic from March 1 to Sept. 12; in all, 4.28 grams were given per sheep. These animals increased in weight

Fig. 3. Cow 5, at start of experiment, April, 12, 1924.

an average of 27.37 pounds and gave birth to lambs. Sept. 13, we killed one of these sheep (1506) for samples. This animal was in fine condition (see fig. 1), and contained 1.7821 grams of lead and 0.038815 grams of arsenic. The other five sheep of this lot were kept in Oroya for a time and then sent to Punabamba for natural exposure to renguera. None of these sheep nor their lambs has contracted renguera as yet. During the feeding of arsenic these animals gained 27.37 pounds each, or at the rate of 0.165 pounds a day; after the arsenic was stopped, they gained at the rate of 0.112 pounds a day.

Pen 2: Pen 2 was fed on lead oxid from March 1 to Sept. 12; in all, 25.44 grams were fed to each animal. These animals

gained an average 18.42 pounds per head, or at the rate of 0.11 pounds a day; after the lead oxid was stopped, they gained at the rate of 0.12 pounds a day. During the lead oxid feeding period, lambs were born. The animal in this series that was killed for samples (1509) was also in fine shape. This animal contained 1.886 grams of lead and 0.1598 grams of arsenic. None of these animals has developed renguera since going to Punabamba.

Pen 3: Pen 3 was fed on flue dust from March 1 to Sept. 12; in all, 13.098 grams being given to each animal. These animals gained 23.23 pounds per head, or at the rate of 0.14 pounds a day during the feeding period. After the dust was stopped,

FIG. 4. Cow 5, Sept. 12, 1924, after having eaten 119.168 grams of flue dust.

they gained at the rate of 0.06 pounds a day. The animal in the series that was killed for samples (1518) contained 1.8104 grams of lead and 0.0622 grams of arsenic. Neither the old sheep nor their lambs in this experiment have developed renguera.

CATTLE EXPERIMENTS

In our feeding experiments with cattle, renguera did not enter, because renguera is a disease of sheep only. We simply tried to arrive at the amount of flue dust that cattle can stand at the elevation of Oroya, 12,200 feet. With this in mind, we fed flue dust to four animals. The amount that an animal can eat without going to pieces, depends on a great many things. Chiefly among them seems to be the ailments from which the animal is suffering when the experiment is started. For example,

the Massachusetts Agricultural Experiment Station fed a cow that had advanced tuberculosis, 29 grams of lead arsenate, with fatal results. Another cow ate 50.4 grams in one dose and lived. Other cows were given 16.5, 56.7, 153.15, and 234.4 grams before death.

In Oroya, we fed two steers 1.1 grams of flue dust a day for 47 days, or a total of 51.7 grams. This made these animals too sick to eat much for a few days, but nothing more. A cow that was driven into Oroya for experimental purposes, because of a bad diarrhea, on being fed flue dust, first became much better. The diarrhea stopped, and the animal gained in flesh, but when she had eaten 9.552 grams, she went off feed and died in a

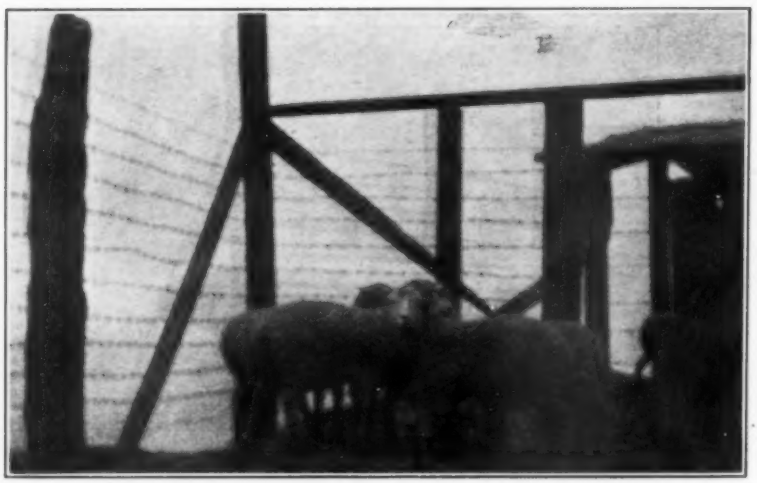

FIG. 5. A smoky day in the corral at Oroya.

couple of days. Cow 5 ate 119.168 grams of flue dust, and died nine days after the feeding of flue dust was stopped. I feel quite sure that this animal could have been saved if given lessening doses of flue dust, rather than stopping the poisoning at once. If is, of course, well known that when a high resistance to arsenic has been attained, it is quite often fatal to stop the drug completely all at once.

The steers, to which we fed 51.7 grams of flue dust, were fed alfalfa until Oct. 10, when they were killed for samples and meat. At that time, they contained 7.661 grams of lead and 2.202 grams of arsenic each, most of which was in the intestines. Cow 7, which died after eating 9.552 grams, on postmortem

showed a bad case of liver fluke, bolas de agua, and a pleuritic pneumonia. Cow 5, which stood 119.168 grams of flue dust, on postmortem showed a slight case of bolas de agua, and extensive hemorrhage into the heart muscle. The carcass of cow 5 contained 3.145 grams of lead and 0.3713 grams of arsenic.

Summary and Conclusions

From these experiments, I conclude that the tolerance of cattle and sheep for arsenic, lead oxid, and flue dust is a matter of general health, rather than one of elevation. Three of our cattle took large doses before developing symptoms of poisoning. All three of these animals were in pretty good shape physically. The fourth cow was severely ill from verminous diseases, and died promptly from a relatively small amount of flue dust.

Sheep are not as much affected by altitude as cattle. Although 12,200 feet elevation certainly affects animals, the mere elevation is not as severe a drain on the stamina of an animal as an infestation of worms. Animals with severe infestations of worms cannot stand as large doses of flue dust as healthy animals.

Sheep in good health withstand and get fat on 4.285 grams of arsenic, 25.443 grams of lead oxid, or 13.098 grams of flue dust.

Sheep cannot be given the renguera by feeding 4.285 grams of arsenic, 25.443 grams of lead oxid, or 13.098 grams of flue dust, when kept in corrals and fed alfalfa hay.

BIBLIOGRAPHY

Bailey, L. H.: Arsenite under sprayed trees. Corn. Univ. Agr. Exp. Sta. Bul. 101.
Fernald, C. H.: Poisonous doses of insecticides. Mass. Agr. Exp. Sta. Bul. 2.
Harkins, W. D., & Swain, R. E.: The chronic arsenical poisoning of herbivorous animals. Jour. Amer. Chem. Soc., xxx (1908), 6, pp. 928-946.
Haywood, J. K.: Injury to vegetation and animal life by smelter wastes. U. S. Dept. Agr., Bur. Chem. Bul. 113.
Paige, Jas. B.: Cattle poisoning from arsenate of lead. Mass. Agr. Exp. Sta. 21st Rpt., Part II, Jan. 1909, p. 183.
O'Kane, W. C., Hadley, C. H., & Osgood, W. A.: Residues after spraying. N. H. Agr. Exp. Sta. Bul. 183.

CHICAGO DRINKS A LOT OF MILK

Approximately 44,000 eight-gallon cans of milk were delivered daily to the city of Chicago, during 1924, by 26 railroads, which carried 68 per cent of the supply, and 141 motor trucks, which transported 32 per cent, according to studies recently made by the Bureau of Public Roads. If any milk consumed in the city was delivered in any other way, the amount was negligible.

Different

"Her father is familiar with many tongues."

"Ah, a linguist?"

"No, a physician."

PUBLICITY FOR THE VETERINARY PROFESSION*

By R. R. DYKSTRA

Kansas State Agricultural College
Manhattan, Kansas

Publicity is something that men have striven for through countless ages.

In the Sermon on the Mount it is stated:

"Ye are the light of the world. A city that is set on a hill cannot be hid."

"Neither do men light a candle and put it under a bushel, but on a candle stick; and it giveth light unto all that are in the house."

Publicity for the veterinary profession can be obtained through many sources. My audience this afternoon consists almost entirely of veterinarians and therefore my paper shall deal with the activities of veterinarians in securing publicity for themselves and for their profession.

This paper is therefore divided into three main sections, each having a heading as follows:

I. Individual Veterinarians as Publicity Agents.
II. Veterinarians in Public Positions as Publicity Agents.
III. Veterinary Organizations as Publicity Agents.

I. INDIVIDUAL VETERINARIANS AS PUBLICITY AGENTS

It is claimed that there are in the United States approximately 8000 veterinarians engaged in the practice of their profession in one of its numerous phases. The average citizen obtains his knowledge of the profession very largely from that one of these 8000 veterinarians located in his community. If a veterinarian is therefore genuinely interested in his profession and wants his profession to be held in high esteem, it is incumbent upon him so to conduct himself as to create a favorable impression.

From the strictly professional standpoint his work must be of a very high order. The time has definitely passed when veterinarians can demand very high class medical service for themselves or members of their families, and then turn around and administer crude, partially-indifferent service to their animal patients. In matters of this kind we must have an ideal and then make an earnest attempt to live up to that ideal as nearly as possible.

*Presented before the thirty-second annual meeting of the Missouri Valley Veterinary Association, Omaha, Nebraska, July 13-15, 1925.

The writer has many times told his students that an ideal of the veterinarian in this connection should be that anything not good enough for a member of the veterinarian's family, from a medical standpoint, should not be considered good enough for the veterinarian's animal patients. A statement such as the preceding is of course not to be accepted literally and should be given a broad, practical interpretation. It is nevertheless an ideal for veterinarians to carry around with themselves and if they have it in mind they are not likely to transgress professional standards.

More and more the veterinarian of today must be a man of unquestioned ability. We are not in position to offer a critical analysis of the requirements of professions other than veterinary. We have thought many times that the veterinarian of today must have a wider knowledge, of many different sciences, than a person in almost any other profession. The veterinarian, if he is to be successful, must be a comparative anatomist, a pathologist, a bacteriologist, a parasitologist, a geneticist, a sanitarian, etc., etc.; he must have a fair knowledge of human ailments, and in addition a broad, liberal, general education. This paper is not intended as a criticism of other professions, but we have on numerous occasions been surprised to find out that the average human surgeon has absolutely no knowledge of the anatomy of domesticated animals. There are but few veterinarians who, in addition to their knowledge of the anatomy of domesticated animals, have not a very fair knowledge of human anatomy. Numerous other instances might be cited to indicate the educational demands made upon the veterinarian.

False Impressions Created

I have made it a particular point to determine the impressions created upon men of other professions by certain veterinary procedures. Many times it is difficult to get an expression, but when one does get this information, usually it is that veterinary practices are in many instances crude. Those of us who are engaged in work of this kind are aware of the fact that what others speak of as crudeness is in a measure due to the conditions under which we must perform our work, and when the matter is finally boiled down it must be admitted that veterinarians are probably more capable than any other class of professional men to meet the difficulties of their vocation successfully. We must not, however, forget the ideal that we mentioned in a preceding paragraph, and that is—to pattern after the human physician. In surgical

work, if for appearances only, our clothing, hands, and instruments must be clean. The operative area must be shaved, disinfected, and the patient anesthetized. Not more than a month ago, a very busy practitioner told the writer that he was not able to do these things because it took too much time. I do not believe that from the professional standpoint we can afford to adopt such an indifferent attitude. The owners of the animals that we treat may not always express their true impressions of the manner in which we handle out patients, but behind our backs they are likely to say things that would make our ears burn. We must not forget "to be merciful and humane, preventing needless suffering of dumb beasts."

A certain practitioner in Kansas has, for more than a year, contributed articles of a veterinary nature rather regularly to his home paper. It is one Kansas community from which the Kansas State Agricultural College receives very few inquiries about the handling or treatment of animals. This particular veterinarian has demonstrated to the live stock owners of that community, by his timely articles, that he is a man of high professional attainment. He has furthermore indicated a sympathetic attitude toward agriculturists by becoming president of the local county farm bureau. At various times he has been a leader in his community in numerous enterprises. He has always been a church worker. He is, furthermore, neat in personal appearance and at all times professional-appearing. It is almost needless to state that the veterinary profession needs but little additional publicity in that community.

The individual veterinarian should be heard more frequently in his own home community than is usually the case. As a class of men, we are too modest. If other professions had to their credit the list of attainments of the veterinary profession, it would be constantly dinned into our ears. The individual veterinarian can do no greater good to himself or to his profession than by careful, tactful, judicious statements, at opportune moments, about his profession. It is professionally sinful to be bold or blatant, but being too humble is also to be condemned. The well-poised, professional man will make neither mistake.

II. Veterinarians in Public Positions as Publicity Agents

Several members of the veterinary profession, on account of the public nature of their work, or because they are in state or

federal employ, are in position to give the profession the widest publicity.

It is men in such positions who are called upon to appear as representatives of their profession in numerous ways.

On account of the comparatively public nature of their work, and because the general public judges the profession by these men, and because of the fact that the opinions of these men on veterinary affairs are frequently sought, they are in position to do the profession an immense amount of good. *They must be combatively for the profession.* They must be governed at all times by one dominant idea so far as their relations to the profession are concerned. It is not a simple matter to explain this idea in a few words. The central thought, however, is that members of the veterinary profession are, by training, the best qualified to handle all those matters relating to ailments of live stock. No one will deny the correctness of this thought. In every other walk of life there are men who are specially trained and prepared to carry out certain duties. We look to such men for guidance and if their general reputation for professional ability is good, we accept their judgment with but little question. This should also apply in the case of the veterinary profession. The live stock industry is entitled to the very best in the way of services when their animals are ailing. The public veterinarian can stand squarely on his feet when he defends the thought that for the best of the live stock industry it is necessary to employ the trained veterinarian for the control and prevention of animal diseases. It is absurd to admit to the slightest degree that anyone whose training is not along veterinary lines is as qualified to give veterinary service as the graduate veterinarian.

Live Stock Industry Entitled to the Best

The public veterinarian, owing to his numerous contacts, is constantly approached with plans, measures, etc., in which the idea is advanced that the general health of America's live stock may be taken care of in as good a manner by those not trained professionally, as by the veterinarian. *He must be firm in maintaining that the live stock industry is entitled to the best,* and the graduate veterinarian alone can give it. To take any other attitude is bound to prove harmful to the live stock industry. I consider this principle and its dissemination as one of the special duties of the public veterinarian.

The public veterinarian should make an effort to appear on the program of live stock associations. In this capacity he should tell, in a tactful manner, of the accomplishments of the veterinary profession. He may even go so far as to outline preventive, sanitary measures that can be carried out by the average layman.

In his public capacity he must be prepared to advise carefully and with sober judgment, when he is consulted in regard to legislation or other matters concerning the veterinary profession. He must not be so strongly imbued with combativeness for the strictly professional side that he fails to get the owner's viewpoint or that he overlooks the welfare of the live stock industry. The veterinary profession can stand only as the live stock industry prospers, and therefore our advice should be constructive.

The public veterinarian must be ready on all occasions to defend the profession against malicious attacks, without at the same time arousing greater antagonism. A few weeks ago the writer received a letter from a city officer in which the statement was made that the question had arisen as to whether it would be advisable to immunize against rabies the dogs in that particular city. The city officer wanted to know whether it was not a fact that immunization was of but slight value and that the feeling for this measure had been aroused very largely by veterinarians for the advancement of their own pecuniary interests. We proceeded to write the city officer that we were convinced that the immunization was a valuable measure, and furthermore that, in our opinion, a veterinarian would be derelict in his duty if he did not take a positive stand in these conditions, and that it was the veterinarian's duty to warn the people of communities of the danger to which they were exposing their children and themselves in rabies-infected territory if they did not adopt preventive measures. The fact that the veterinarian profited from the immunization, in my opinion, was a matter of very minor importance. The city officer took the matter in the proper light and the result was that the danger of an extensive rabies outbreak in that community has been overcome, and that city officer is now an active friend of the veterinarian.

III. Veterinary Organizations as Publicity Agents

Veterinary organizations in the past have had much with which to contend. I believe that they have weathered the storm and that from now on they will have a more enthusiastic support of the veterinarians who form the bulk of the profession, and they

are—the practitioners. It has been an uphill fight to obtain many of the blessings that we now enjoy. In most states, live stock owners have protected their live stock interests by insisting that the veterinary activities, of those not qualified, shall be limited. This has resulted in placing upon our statute books the regulations governing veterinary practice.

In the United States Army the veterinary profession, after a very hard fight, has been given the recognition to which it is due as evidenced by the rank the veterinarian can now attain.

The United States government has furthermore given recognition to the veterinary profession by demanding that all persons engaged by the government in work of a veterinary nature shall be fully qualified as evidenced by a diploma from an accredited institution of learning.

I feel, though only three general examples are mentioned in the preceding paragraphs (and there could be many more), that this recognition is unquestionably the result of organized effort as expressed by the state, sectional, and national veterinary associations.

Furthermore, these organizations have in a very large measure supplied us constantly with new methods and new thoughts, and in general have kept the profession on a high plane.

It seems to me that the time is fast approaching when our organizations must take a more active part in obtaining desirable publicity for the profession. The profession is not lacking in attainments, but the general public knows little about them.

The American Medical Association, a few years ago, commenced to issue what they speak of as "a journal of individual and community health." The journal is entitled, *Hygeia*. It has a wide general circulation. Lay journals and newspapers are constantly quoting from it because it is authoritative. It publishes timely articles on matters relating to human health. Incidentally, and correctly so, it advises the employment of the best trained person for the handling of human ailments, and that is—the human physician. I know that this journal has had an immense influence in spreading the gospel of good medical care. While it has disseminated useful information, it also has corrected many erroneous ideas regarding medical matters. *Hygeia* is printed in magazine form, on the very best of paper, in clear, easily-readable print, is profusely illustrated, and appeals strongly to the average person.

It seems to me that our national veterinary organization should look into the matter of disseminating information of a veterinary nature in the same general manner as *Hygeia* is doing for humans. If a popular veterinary journal were issued, articles could be written for it by veterinarians qualified to do so, and because most of us lack the necessary literary training, it could be edited and popularized by a professional writer. Such a journal, if published, should be sent to all public libraries, high schools, live stock journals, and other fountain-heads of general and live stock information. The live stock papers should be encouraged to copy material from such a popularly written veterinary journal. It would give the profession widespread publicity and, in the minds of laymen, place it upon the plane which it justly deserves.

And while veterinarians as individuals, and as organizations, are giving thought to these matters, let us continue to function perfectly and for the good of America's live stock industry. Let us continue to inspect meats, control hog cholera, fight tuberculosis, stamp out foot-and-mouth disease and contagious pleuropneumonia, so that it may never be said that the veterinarian, though not receiving his full measure of public appreciation, has failed in performing his duty.

ONE HUNDRED TEN COUNTIES TUBERCULOSIS-FREE

One hundred ten counties in the United States have practically eradicated bovine tuberculosis from within their boundaries, according to a summary of progress issued by the Department of Agriculture, covering eradication work up to October 1, 1925. These counties, known as modified accredited areas, have completed the testing of all cattle within their borders and removed all of the known infected cattle. The 110 counties now on the free list represent a gain of 10 counties over the preceding month and show noteworthy progress, compared with the status of the area work at the beginning of the calendar year, when 53 counties were on the modified accredited list.

EXAMINING BOARD FOR FLORIDA

In compliance with the provisions of the new Veterinary Practice Act passed in Florida, Governor Martin recently announced his appointments to the Board of Veterinary Examiners created under the act. These are Dr. T. J. Mahaffy, of Jacksonville; Dr. Paul Fischer, of Bartow; and Dr. A. L. Shealy, of Gainsville.

RECENT PROGRESS IN MEDICAL SCIENCE

By WM. H. FELDMAN,

Assistant Veterinary Pathologist, Colorado Agricultural College, Fort Collins, Colorado

INTRODUCTION

The progress of mankind has ever been dependent upon the ability of society to protect itself against the insidious powers of Nature, and the advance of civilization can be rather accurately measured by the degree to which man has conquered the physical ailments, not only of himself but of the lower animals as well.

One has but to glance through the pages of history to appreciate how humble and helpless become the mighty and lowly alike at the time of pestilence, and how as a consequence the very foundations of society are shattered and the history of entire nations altered. Races were weakened and the social scheme so changed in the past by these stupendous misfortunes that it is difficult for one in this modern age fully to comprehend the influence these plagues have had in moulding our present society complex.

H. G. Wells, in his history, likens Napoleon I to the bacterium of a pestilence but goes on to say that "even regarded as a pestilence he was not of the supreme rank; he killed far fewer people than the influenza epidemic of 1918 and produced less political and social destruction than the plague of Justinian."

There is considerable evidence to substantiate the contention of some that malaria played an important part in the decline of Greek and Roman civilizations, and the Black Death (1348) which swept over Europe and on eastward into China resulted in so many deaths as practically to prostrate whole empires. For instance, two-thirds of the students at Oxford University died and the total loss for England alone was between one-quarter and one-half the entire population, while the Continent suffered in the same proportion. It was said that the living could hardly bury the dead, and the sanitary conditions that arose were indescribable. This was in the 14th century. The same disease raged violently again in the 17th century, and in the city of London about 70,000 people died. When one considers the

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population of London at that time, this figure is indeed appalling.

To consider more modern examples of man's inability to cope with disease successfully, we have only to remind ourselves that during the Spanish-American War twenty percent of the American soldiers were sick with typhoid fever, and that the death loss from this disease was greater than the total loss from bullets. (Fortunately, with our present knowledge of anti-typhoid vaccination, a repetition of this tragedy is impossible.) Again consider the ravages of the African sleeping sickness. The opening up of equatorial Africa has resulted in such an intercommunication between the natives of the different districts that, three years after the introduction of the disease into Uganda, 100,000 natives had succumbed to its ravages. Furthermore, the prevalence of the tsetse fly has constituted an almost unsurmountable barrier to white people who might otherwise find profit and pleasure in a part of the Dark Continent that is extremely fertile.

The experience of the French in their attempt to build the Panama Canal, during the latter part of the 19th century, demonstrated the futility of man's attempt to conquer Nature without the information necessary to control all the factors. Thousands of workers died from yellow fever and malaria, and the inability of the canal company to control the situation was largely responsible for its failure to complete the enterprise. However, we should note that a few years later the U. S. Government, by the application of knowledge gained in the years after the French failed, was able to banish malaria and yellow fever from the canal zone. With these diseases removed the Americans were able to do what the French could not.

In the last war it was only by the application of scientific medicine in the prevention and control of contagious and infectious diseases that made the terrible catastrophe less horrible and costly. However, even with all our knowledge of this phase of medicine, how striking was our utter helplessness in the attempt to check the spread of influenza. The disease spread over practically the entire world, leaving death and misery in its wake, yet the medical skill of the nations was unable to suggest a means of control. Vaughn, in his recent work, Epidemiology and Public Health, says, "We are inclined to boast that the age of pestilence is past but with a fair acquaintance with the history of epidemics, I dare say that the world has never before known a pestilence more widespread, more intensive and appalling in

its progress, or more destructive to life, than the epidemic of influenza which apparently came into being, and grew in violence as the World War passed through its final stages—it seemed that nature gathered together all her strength and demonstrated to man how puny and insignificant he and his forces are, with all his murderous machinery, in the destruction of his fellows. We have not passed beyond the age of pestilence."

Through the untiring efforts of the research worker medical science has made wonderful strides during the past twenty-five years. We have to mention only a few of the more important achievements to emphasize this. Everyone is familiar with the benefits derived from smallpox vaccine, diphtheria antitoxin, anti-hog cholera serum, anti-rabic treatment of Pasteur (1880), anti-typhoid vaccine, blackleg aggressin, and anti-anthrax serum. The lay press has acquainted the public-at-large with these things and, in addition, has reported the finding of the cause of yellow fever. The life cycles of many of the animal parasites have been worked out, making it possible to control such diseases as roundworm infestation of hogs, and the relationship of the tick to Texas Fever has made it possible to rid a greater part of the South of this disease. The role of the body louse (*Pediculus humanus*) in the transmission of typhus fever has been clearly revealed, and the finding of the *Spirocheta pallida* as the cause of syphilis paved the way for the discovery by Paul Erhlich, in 1910, that arsenic in a compound known as salvarsan was a cure for syphilis, and as a consequence one of the most horribly tragic diseases of the human body became submissive to the tireless patience of medical research. The importance of the carrier in the spread of such diseases as typhoid and diphtheria is fully appreciated, and the epidemiology of these diseases better understood. As a result they are better controlled.

The above is but a brief resume of a few of the advances made in man's attempt to control his environment, and is by no means the sum total contributed by medical science to the relief of suffering humanity. The progress mentioned has occurred largely in the interval from the time of Pasteur to within two or three years ago. Since that time some truly remarkable achievements are recorded, the more striking of which will now be briefly described.

The Discovery of the Cause of Scarlet Fever

One of the most outstanding contributions to the advancement of medical science during the past year (1924) has been the

newer knowledge concerning the cause, treatment and prevention of scarlet fever. The progress has been such as to make the outlook for the control of this serious disease indeed promising.

Drs. Geo. F. and Gladys Henry Dick, of the John McCormick Institute of Infectious Diseases, in Chicago, and Dr. A. R. Dochez, of Philadelphia, working independently, announced within a short time of each other the finding of the specific germ responsible for this dangerous disease. The organism has been called *Streptococcus hemolyticus scarlatinae.*

Once the cause of a disease is definitely determined the research worker usually turns his attention to the task of developing agents for the treatment and prevention of the malady. Success in this direction is often achieved, and of the greatest importance are the findings of Drs. Dick and Dochez in this regard.

There is now available, as a consequence of the discovery of the germ causing scarlet fever, a method known as the Dick test, by which it is possible to determine with considerable accuracy those individuals who are susceptible to scarlet fever. This will be and is of immense value in controlling the disease among school children and among nurses and physicians, who come in contact with the disease in their daily routine, for by selecting those who are susceptible, and rendering them immune by the use of an immunizing toxin the disease can positively be prevented.

The Dick test is a simple procedure, resembling somewhat the Schick test for detecting those who are susceptible to diphtheria. It consists of an injection into the skin of the arm or abdomen of 0.1 cc of a 1:1000 dilution of a filtrate of the above named germ. If the person so injected is susceptible to scarlet fever an inflammatory reaction occurs at the point of injection four to six hours later. A positive reaction consists of a reddening of the skin, associated with more or less swelling. A negative reaction is indicated by the presence of only the needle prick at the point of injection. A susceptible individual can be immunized against the disease by receiving three injections of the toxin of the filtrate at five-day intervals. The dosage is gradually increased from an amount equivalent to 300 skin-test doses at the first injection to 1000 skin-test doses at the third injection.

The same toxin or filtrate prepared from the *Streptococcus hemolyticus scarlatinae* was injected into a horse in gradually increasing dosage and the serum from the horse's blood was found to contain anti-toxic properties, of such a potency that 10 cc of

the antitoxin neutralized twenty times the toxin necessary to produce the experimental symptoms of scarlet fever in adults.

To date the evidence tends to show that this anti-scarlatinal serum, or scarlatinal anti-toxin, possesses marked curative value in the treatment of scarlet fever, and particularly so in the early stages of the disease. In some cases complete recovery has been observed in from 12 to 36 hours after the administration of the antitoxin.

With these new facts added to the pathology of scarlet fever, the control and prevention of this disease becomes a problem quite similar to that of diphtheria, and we can look with confidence to its probable suppression within a few years.

Relation of Avian Tuberculosis to the Tuberculosis of Swine

For a great many years animal pathologists have considered bovine tubercle bacilli to be responsible for a large share of the tuberculosis in hogs. The infection was supposed to take place through the agency of the feces in the feed-lot, and the drinking of unpasteurized skim milk from creameries.

The attention of Drs. Van Es and Martin, of the Nebraska Station, was drawn to the apparent increase in the cases of swine tuberculosis in the past fifteen years, and the complete lack of correlation in the incidence of the disease in swine compared to its incidence in cattle. For instance, they observed by studying the data of the Meat Inspection Division of the U. S. Department of Agriculture, for the period of 1907-1922, that the number of retentions of swine carcasses on account of tuberculosis per 1,000 animals rose from 13.83 in 1907 to 163.87 in 1922. This was an increase of about 150 hogs per 1,000. In cattle, for the same periods, they found that the number of retentions did not exceed in any year 27 per 1,000. The wide divergency in these figures suggested that further information bearing upon the etiology of the disease in hogs was imperative, if a logical policy of control and eradication of the disease was to be worked out.

These workers inoculated guinea pigs and chickens with a large amount of tuberculous material from the carcasses of hogs slaughtered for food and from the results obtained have brought to light information dealing with the pathology of swine tuberculosis which will be far reaching in any future recommendations formulated for its eradication.

Summarized briefly the following conclusions were reached:

1. The greater part of tuberculosis in swine is due to the avian strain.

2. Chickens and cattle must be equally considered in the problem of swine tuberculosis.

3. From the available data there has been a marked increase of tuberculosis in chickens during the past fifteen years.

4. In applying the tuberculin test to swine, both mammalian and avian tuberculin should be used, since the use of the mammalian type alone will result in the failure to detect many tuberculous animals.

It will be interesting to observe what influence the facts revealed by Van Es and Martin will have upon our national tuberculosis-eradication plan. Certainly the importance of the chicken as a disseminator of the disease cannot be ignored.

Blood Test for the Diagnosis of Bacillary White Diarrhea Infection in Chickens

The control of bacillary white diarrhea in young chicks has long been a serious problem for the poultryman. This is the most destructive disease in baby chicks with which the poultry raiser has to contend, and has often caused a loss of from 90 per cent to 95 per cent in the baby-chick crop.

While the cause of the disease (*B. pullorum*) has been known for a long time, the peculiar manner of its perpetuation in the flock made difficult or impossible its control by medicinal means. The germ is found within the ovary of the affected adult and as a consequence many of the eggs of the affected individuals have incorporated within them some of the same organisms. Upon hatching, the baby chicks from such eggs are already infected and the disease becomes evident within a short time. Treatment of the sick chicks is futile, consequently the efforts on the part of research workers have been centered on devising a successful method of eradication by removing from the flock the source of the infection. From the standpoint of physical appearance it is impossible to determine which of the adult birds harbors the infection, so it became necessary to devise a blood test that would differentiate the diseased birds from the normal. This has been accomplished and thousands of tests for bacillary white diarrhea are being run annually by both private and state laboratories all over the United States.

In our own laboratory, during the past year, this work has demanded a great deal of the time of Dr. F. Cross and Miss Ruth Harrison, our technician. The total number of birds tested during the past six months is something over 11,000, with about ten per cent positive. Those birds giving a positive test are removed from the flock at once and usually sent to market. Thus the source of infection is eliminated.

With this test available for the control and eradication of bacillary white diarrhea, the poultry industry should soon attain a position of stability, which was impossible in the face of the high mortality from this disease.

Discovery of Carbon Tetrachlorid as an Efficient Agent for the Removal of Hookworms

Few diseases so insidiously break down the physical and mental make-up of the individual as does hookworm infection. The person so infected often suffers in his mental and physical development to the point of profound stupidity and a loss of efficiency amounting at times to almost complete inertia of his physical and mental powers.

The prevalence of this disease is indeed startling when one learns that probably sixty per cent to eighty per cent of India's huge population of over 300,000,000 is infested, and that over 2,000,000 American citizens living in the states of Alabama, Louisiana, North and South Carolina, Georgia, Florida, Mississippi and Texas suffer from the effects of the parasite. During the World War more than one-half million men in the U. S. Army were examined for hookworms, and their presence demonstrated in 56,740, or over eleven per cent. Chandler estimates that the disease affects over one-half billion of the world's population. When one considers that the individuals so affected lose from fifty to sixty per cent in efficiency, the demand for an efficient medicament is emphasized. The pitiful living conditions in affected communities also makes the possession of a satisfactory anthelmintic imperative.

In the past we have had two agents for combative use against the hookworm. These were thymol and oil of chenopodium. They were both unpleasant to take and death occurred all too frequently following their administration. Furthermore, two or three treatments were necessary before a cure could be obtained. These disadvantages made thymol and oil of chenopodium far from satisfactory; consequently, the discovery that

carbon tetrachlorid was effective in the removal of hookworms in dogs by Dr. M. C. Hall, of the Bureau of Animal Industry of the U. S. Department of Agriculture, was eagerly received by workers in the field of hookworm eradication in the hope that it would be equally as valuable in expelling these parasites from the human intestinal tract.

It has indeed proved a Godsend, and as proof of its efficacy in the treatment of hookworm infection we have only to quote the conclusion of Dr. S. M. Lambert, Medical Officer, Colony of Fiji, on the use of this drug in the treatment of 20,000 cases of hookworm disease.

"1st.—Carbon tetrachlorid is a vermifuge and vermicide of great potency.

"2nd.—It gives little discomfort to the patient.

"3rd.—It permits of rapidly treating at a low cost vast populations suffering from hookworm disease.

"4th.—Re-examination of the feces of 823 treated patients indicated that one treatment administered to each individual in a given area had lowered the original infection rate of 100 per cent to less than nine per cent.

"5th.—Clinically, the standard of health of the community is immediately raised."

Comparing carbon tetrachlorid with oil of chenopodium, Hampton states that the latter gives from thirty per cent to fifty per cent of cures, while carbon tetrachlorid gives microscopic cures in ninety per cent and the cost is only about one-tenth as great.

More recently Dr. Hall has recommended the use of tetrachlorethylene, a more complex product, in the place of carbon tetrachlorid. Dr. Hall claims the new remedy to be even more efficient than carbon tetrachlorid and its administration is attended with greater safety.

Once again we observe man reaping the immense benefits from facts gathered from the use of animal experimentation. As Ernest Harold Baynes so aptly puts it in a recent issue of Hygiea: "We have seen that all these great advances in medicine and surgery have been made as the result of experiments on living animals, and you will agree, I believe, that in all probability further advances in these fields must be brought about by the same means."

Present Status of Cancer Research

A review of this sort would be incomplete if one failed to outline the present status of the cancer problem. This disease causes the deaths of over 90,000 people every year (93,000 in 1921) in the United States. There are considerable statistical data to support the contention that cancer is on the increase to an alarming degree and that one person out of every ten, past the age of forty, will die of the malady.

Feeling that we should have as accurate information as possible on the present status of the cancer situation I addressed a communication to Dr. Francis Carter Wood, of the Crocker Institute of Cancer Research, requesting information as to the newer facts. Dr. Wood kindly supplied me with some valuable material, but a digest of the same failed to reveal anything new as to the cause of this disease, although some interesting points were brought out in relation to the diagnosis and surgical aspects in relation to the successful treatment of cancer.

A few months ago the newspapers devoted considerable space to the purported discovery of the cause of cancer by a Dr. Glover. This worker claimed to have isolated and grown in pure culture a bacterium which he contended was responsible for the disease. He also produced some sort of a serum which he hailed as a specific cure. Dr. Wood has the following to say on this point: "The trained worker knows that if there is anything which the work of the past twenty years has demonstrated, it is that bacteria are not the exciting cause of cancer; that they are frequently present in the normal tissues, a fact known for the past thirty years, and that in most instances they are harmless saprophytes."

Dr. E. Starr Judd, of the Mayo Clinic, maintains (1924) that the work of Broders in grading the malignancy of cancer on the basis of cell differentiation is the most important development in our knowledge of cancer in recent years.

Broders, on the basis of a study of 537 cases, classifies the malignancy of epithelial new growths upon the extent to which the cells of the cancer resemble the parent cells of the tisue from which they sprung. On this basis he would class, as grade 1, those cancers in which about one-fourth of the cells were undifferentiated, that is, were embryonic in appearance, and in which the remaining three-fourths of the cells showed characteristics in common with the cells of the normal tissues from which they arose. Grade 4 is that type in which none of the cells are

differentiated, or resemble cells of the parent tissue, but instead a great many contain deeply-staining nucleoli, mitotic figures and other embryonic features. Grades 2 and 3 hold intermediate positions. Dr. Judd says that by studying a case of cancer clinically from this standpoint we can now decide when to operate and when not to operate, and the surgeon is "able to estimate the end results with a fair degree of accuracy."

About the only other advance in the control of cancer that should be mentioned is the increased knowledge regarding the use of the X-ray in the treatment of the disease. Great improvements have been effected in the X-ray apparatus, which makes it possible to treat internal and deep-seated cancers which are not amenable to the knife. The General Electric Company recently built a machine of 200,000-volt capacity, the rays of which will pass through one-fourth inch of lead or a foot of aluminum. The rays pass through a brick wall two feet in thickness, and photographs of the bones of the hand may be made at a distance of one block.

The degree of penetration of the X-ray depends upon the wave length used. The shorter the length the deeper the penetration. The above-mentioned machine has a wave length of one-fifth of a billionth of an inch, and far surpasses any other apparatus now in use for this reason. So extremely powerful are the rays from this machine that the life of the patient may be endangered, and its use must be carefully restricted to those skilled in its operation and by the proper selection of suitable cases.

While we are as far as ever from the actual cause of cancer, the past few years have witnessed notable advances in the diagnosis and treatment of this disease.

Influence of the Ultraviolet Rays upon the Antirachitic Properties of Foods and Their Therapeutic Application

A remarkable disease of the bones, affecting especially children and known as rickets (or rachitis), has been the subject of study for a great many years. This disease, which results in the bones becoming soft and fragile, appears to be due to some obscure disturbance of metabolism plus certain mineral deficiencies of the diet, as a consequence of which there are the wrong proportions of phosphorus and calcium available for deposit in the bones as calcium phosphate. Upon this substance the strength and rigidity of the skeleton largely depends.

For many years the treatment for this condition was dependent largely upon the influence exerted by cod-liver oil as part of the diet. This seemed to re-establish the proper proportion between the phorphorus and calcium, making them available for tissue use. Exposure of the patient to the sunlight, or to the ultraviolet rays, has the same effect.

In recent experimental studies on this question by Steenbock and Daniels, it was found that it was possible to make a large number of the commoner foods antirachitic by the simple procedure of exposing them to the ultraviolet light. The list includes wheat, rolled oats, corn flakes, corn starch, meat, milk, and egg yolk. A great many fats, in the fresh state, can also be activated. Some of these are butterfat, lard, corn oil, cocoanut oil, cottonseed oil and olive oil.

Since every living thing whose skeleton is built of bones must secure the proper calcium phosphate deposit in order to maintain health, the antirachitic properties of food at once becomes important. Since it has been shown that olive oil, exposed to the ultraviolet rays eight months previously, still retained its full antirachitic properties, it occurred to me that before long it should be possible to purchase activated cottonseed or olive oil from the drug or grocery store, and to insist upon our favorite breakfast cereal having been previously exposed likewise. With our iodized salt, our vitaminized yeast, and our activated antirachitic cream of wheat, the nation should soom become sufficiently medicated to discourage any and all disease.

More recently Frick and Bullard have reported on the beneficial effects of the ultraviolet light as an adjuvant in the treatment of infected wounds, purulent skin conditions and distemper in dogs. Affected animals were daily exposed to ultraviolet radiation for a variable period up to twenty minutes with striking results in a comparatively short time.

A report of this kind suggests many possibilities in the future of therapeutics. Veterinary colleges in particular should be alert to the opportunity to embrace all that is of value in this phase of medical advance. Further work and observation is necessary before we can form a proper estimate of the benefits and limitations of this newer therapy. Future reports, to be of any value, should be based on experimental work conducted along the lines of accepted research procedure. While the observations of the practitioner, on individual cases from his practice, are interesting, they seldom possess anything of scientific value because of the

lack of control conditions. For this reason the determination of the exact status of the ultraviolet ray in veterinary therapy will rest with those in our profession engaged in the investigational phase of animal pathology.

The work of Frick and Bullard, while not extensive, is nevertheless of the utmost importance in the effect their report may have in stimulating others to proceed along the same lines in man's untiring effort to unravel another of Nature's complexities.

REFERENCES

INTRODUCTION:

Osler, Wm.: The Principles and Practice of Medicine. (8th ed.; New York, D. Appleton & Co., 1916) p. 138, 259.

Chandler, Asa C.: Animal Parasites and Human Disease. (Boston, Stanhope Press, 1918) p. 2.

Wells, H. G.: The Outline of History. (New York, The MacMillan Co., 1923) p. 457, 470, 528, 640, 712, 922.

Vaughn, Victor C.: Epidemiology and the Public Health, I. (St. Louis, C. V. Mosby Co., 1922) p. 8.

SCARLET FEVER:

Dick, G. F., & Dick, Gladys H.: The prevention of scarlet fever. Jour. Amer. Med. Asso., lxxxiii (1924), p. 84.

Black, Francis G., Trask, Jr., James D., & Lynch, John F.: Observations on the treatment of scarlet fever with scarlatinal antistreptococcic serum. Jour. Amer. Med. Asso., lxxxii (1924), p. 712.

Dochez, A. R., & Sherman, Lillian: The significance of *Streptococcus hemolyticus* in scarlet fever. Jour. Amer. Med. Assoc., lxxxii (1924), p. 542.

Dick, G. F., & Dick, Gladys H.: The etiology of scarlet fever. Jour. Amer. Med. Asso., lxxxii (1924), p. 301.

Dick, G. F., & Dick, Gladys H.: A skin test for susceptibility to scarlet fever. Jour. Amer. Med. Asso., lxxxii (1924), p. 265.

The Outlook: Scarlet fever. Editorial in Jour. Amer. Med. Asso., lxxxii (1924), p. 1266.

Dick, G. F., & Dick, Gladys H.: A scarlet fever antitoxin. Jour. Amer. Med. Asso., lxxxii (1924), p. 1246.

Branch, Charles F., & Edwards, F. Gill: The relation of the Dick test to scarlet fever. Jour. Amer. Med. Asso., lxxxii (1924), p. 1260.

Dick, G. F., & Dick, Gladys H.: Experimental scarlet fever. Jour. Amer. Med. Asso., lxxxi (1923), p. 1166.

TUBERCULOSIS IN SWINE:

Van Es, L., & Martin, H. M.: An inquiry into the cause of the increase of tuberculosis of swine. Univ. Nebr. Agr. Exp. Sta., Res. Bul. 30 (1925).

HOOKWORM:

Chandler, Asa C.: Animal Parasites and Human Disease. (Boston, Stanhope Press, 1918) p. 3, 255, 261, 262.

Mass treatment of hookworm infection. Jour. Amer. Med. Asso., lxxix (1922), p. 2002.

Hampton, C. G.: Use of carbon tetrachloride for removal of hookworms in human beings. Amer. Jour. Trop. Med., ii (1922), 5. Abst. in Jour. Amer. Med. Asso., lxxix (1922), p. 1635.

Lambert, S. M.: Carbon tetrachloride in the treatment of hookworm disease. Jour. Amer. Med. Asso., lxxix (1912), p. 2055.

The hookworm killed by a fire extinguisher. Literary Digest, lxxxiii (1924), 5.

A new hookworm cure. Vet. Med., xx (1925), 7, p. 288.

CANCER:

Wood, Francis Carter: The experimental pathology of cancer. Cancer. (Chicago, American Medical Association, 1925).

Judd, E. Starr: The surgical treatment of cancer. Cancer. (Chicago, American Medical Association, 1925).

Current Opinion, Jan. 1923.

Broders, A. C.: Squamous cell epithelioma of the lip. Jour. Amer. Med. Asso., lxxiv (1920), p. 656.

ULTRAVIOLET RAY:

MacCallum, W. G.: A Text Book of Pathology. (3rd ed.; Philadelphia, Saunders & Co., 1924).

Steenbock, Harry, & Daniels, Amy L.: Irradiated foods and irradiated organic compounds. Jour. Amer. Med. Asso., lxxxiv (1925), p. 1093.

Frick, E. J., & Bullard, J. F.: Ultraviolet light in veterinary medicine. Jour. A. V. M. A., lxvii (1925), n. s. 20 (4), pp. 515-521.

THE 1925 ENDURANCE RIDE*

By U. G. Houck, *Washington, D. C.*

The 300-mile Endurance Ride in the East for 1925 was held in Vermont from October 18 to 23 inclusive. The awards were made on October 24. This Ride is of national importance as it is sponsored by the American Remount Association, the Arabian Horse Club of America, the Horse Association of America, the Kentucky Jockey Club, the Morgan Horse Club, the Thoroughbred Horse Association, and the U. S. Cavalry Association. The associate sponsors are the U. S. Department of Agriculture, the American Saddle Horse Breeders' Association, the Genesee

FIG. 1. JUDGES AND VETERINARIANS OF 1925 ENDURANCE RIDE.

(Left to right) Dr. L. H. Adams, Montpelier, Vt., assistant veterinarian; Dr. W. W. Townsend, Burlington, Vt., judge; Maj. Henry Leonard, Washington, D. C., judge; Mr. Wayne Dinsmore, Chicago, Ill., judge; Dr. U. G. Houck, Washington, D. C., veterinarian; Mr. Lennox D. Barnes, Fitzwilliam, N. H., recorder.

Valley Breeders' Association, the National Steeplechase and Hunt Association, the National Trotting Association, and the Polo Association.

The purpose of these endurance rides is to stimulate general interest in the breeding and use of good saddle horses of a general utility type, possessed of stamina and hardiness, and at the same

*Dr. Houck was official veterinarian to the 1925 Endurance Ride, representing the U. S. Department of Agriculture and the American Veterinary Medical Association. Dr. Houck was assisted by Dr. L. H. Adams, of Montpelier, Vt.

time having the necessary quality to render them suitable for use in the mounted service of the United States, as well as for commercial purposes. In particular, it is desired:

(a) To demonstrate the value of type, soundness, and proper selection of horses for a long, difficult ride;

(b) To ascertain and to demonstrate the proper method of training and conditioning horses for long and severe work under the saddle;

(c) To encourage horsemanship in long distance rides;

FIG. 2. "Peggy," the winner, ridden by Corp. Anthony Quatisky.

(d) To ascertain and to demonstrate the best methods of caring for horses during and after long, severe work, without artificial aids or stimulants.

Seven rides have been held in the East and four in Colorado over measured sixty-mile courses for five consecutive days and under rigid regulations covering the age, weight carried, feed used, and care of animals. No animal which develops lameness or shows any other evidence of distress is permitted to continue in the test.

The good dirt roads of Vermont are ideal for such rides. They lead through beautiful rolling and rugged country, which gives

a desirable variety and there is enough of hill-climbing to test the courage and endurance of the contestants. And usually weather conditions in New England are favorable at the time of the year when the Ride takes place. There seemed to be a feeling, however, among most of the horsemen present, that it would be desirable to advance the dates of the Ride to the first week in October instead of holding it later in the month, as has been customary in the past. The weather conditions were good for the 1925 Ride, with the exception of one day, when it rained practically the entire afternoon. During the remaining four

FIG. 3. "Pathfinder," second place, ridden by Maj. C. L. Scott.

days the weather was quite cold, which was favorable for the horses but somewhat disagreeable for the observers who followed the horses over the courses.

Brandon was chosen as the headquarters for the 1925 Ride. This is a beautiful New England town, situated in a part of Vermont that is especially adapted for such a ride. The ample, well-constructed stables were suitable, and the Brandon Inn, under the management of Mr. Charles Moore, is all that could be desired. We all feel very grateful to Mr. and Mrs. Moore for making our stay at the Brandon Inn so comfortable and happy.

The conditions of the Ride this year were similar to those which prevailed in previous years, with the exception that the weight was reduced from 225 pounds to 200 pounds. The courses were laid out over a rugged section of Vermont in the vicinity of Brandon. The first day's trip led to the U. S. Morgan Horse Farm, at Middlebury, and return; the second day, to Rutland and return; the third day, to Shoreham and return; the fourth day, to Breadloaf Inn, 2,100 feet above sea level, where snow covered the ground, and return; and the fifth day, to Mountain View Stock Farm and return. The routes were laid over different

FIG. 4. "Lillian Russell," third place, ridden by Sgt. Matheson.

roads so that there was practically no overlapping at any time during the Ride.

There were fifteen entries to start, consisting of two Thoroughbreds, four Morgans, six grade Thoroughbreds, one grade Morgan, one Arabian, and one American Saddle Horse. Eleven of the entries finished, all in minimum time, with the exception of Eudora, the purebred Morgan mare from the U. S. Morgan Horse Farm in Vermont, which had a total time of forty-five hours and twenty-four minutes. This loss of time was due to the fact that it was necessary to change shoes en route on the last day, when

she lost thirty minutes and was unable to regain all of the time lost with the minimum time allowed for the day's ride.

In addition to the usual ribbons, the following prizes were awarded:

First prize, $600, the Mounted Service Cup, Arabian Horse Club Medal, The Morgan Horse Club Medal, The Morgan Horse Club gold link cuff-buttons.

Second prize, $500, The Morgan Horse Club gold link cuff-buttons.

FIG. 5. "Rex Rysdyk," fourth place, ridden by Mr. R. T. M. McCready.

Third prize, $400, The Morgan Horse Club gold link cuff-buttons.

Fourth prize, $300.

Fifth prize, $200.

Sixth prize, $100.

In addition, The Morgan Horse Club gave $500 to the rider of the horse in the 1925 Endurance Ride whose score for condition was highest at the end of the Ride, without regard to his position at the finish.

One hundred dollars in gold was given to the rider who showed

the best horsemanship during the Ride without regard to his position at the finish.

In addition to the foregoing prizes, bronze medals, appropriately engraved with facts pertaining to the Ride, were awarded to each rider who successfully completed the 300-mile Endurance Ride. These medals were given by the Horse Association of America.

On the morning of October 18, the following entries were weighed and examined preparatory to the Ride which was to commence on the following morning at 6:30 o'clock.

FIG. 6. "Pioneer," fifth place, ridden by Sgt. John C. Currie.

"Peggy," grade Thoroughbred, entered by 3rd U. S. Cavalry;
"Pathfinder," Thoroughbred, entered by U. S. Remount Service;
"Lillian Russell," grade Thoroughbred, entered by M. S. Daniels, Jr.;
"Rex Rysdyk," American Saddle, entered by R. T. M. McCready;
"Pioneer," grade Thoroughbred, entered by U. S. Remount Service;
"Jessie," Morgan, entered by U. S. Morgan Horse Farm, Vermont;
"Maud Hella," Morgan, entered by the Morgan Horse Club;
"Eudora," Morgan, entered by U. S. Morgan Horse Farm, Vermont;
"El Sabok," Arabian, entered by the U. S. Remount Service;
"Lady Luck," grade Thoroughbred, entered by 3rd U. S. Cavalry;
"Babe," grade Thoroughbred, entered by 3rd U. S. Cavalry;
"Major S," grade Morgan, entered by Maj. C. L. Scott;
"Sugar Plum," Thoroughbred, entered by Capt. J. H. Irving;
"Gladstone," Morgan, entered by U. S. Morgan Horse Farm, Vermont;
"Vanity Fair," grade Thoroughbred, entered by 101st Cavalry, N. Y. N. G.

Many lovers of horses were present when the entries were lined up for examination preliminary to the Ride and they were pleased with the appearance and apparent fitness of the animals for the task before them. Seldom before have there been assembled for such an event so many fine specimens of deep-chested, good-bodied, and well-muscled horses. Most of them showed straight action and all were good-mannered and had been trained especially for this Ride. The ages varied from nine to fourteen years and the entries for the 1925 Ride compared very favorably wih those of other years.

FIG. 7. "Jessie," sixth place, ridden by Mr. Charles Gordon.

"Peggy," the winner of the Ride, is a grade Thoroughbred mare, sired by the stallion "Ganadore," which was secured by the Bureau of Animal Insdutry for service in the remount breeding work. Peggy was also winner in this event in 1924.

"Pathfinder," which won second place, is a Thoroughbred gelding, and was ridden by Major C. L. Scott, of the Remount Service. This was Pathfinder's fifth consecutive participation in this event. In the 1921 Ride he won fifth place; in 1922, fifth place; in 1923, second place; in 1924, fourth place; and in 1925, second place. This established a new record for successful consecutive participation in this Endurance Ride. Pathfinder

Name	Entered by	Breed	Age	Sex	Color	Height	Original Weight	Final Weight	Loss of Weight	Measurements			
										Heart Girth	Loin Girth	Fore Cannon	Hind Cannon
Peggy	3rd U.S. Cav.	Gr-Th	12	M	Bay	15:2½	1010	980	30	72½	73½	8¼	9
Pathfinder	U.S. Remt.	Th	9	G	Bay	15:2½	1000	985	15	72	72	8	8¾
Lillian Russell	M.S.Daniels, Jr.	Gr-Th	11	M	Ch.	15:3½	1060	1040	20	72	74	8	8¾
Rex Rysdyk	R.T.M. McCready	Am Saddle	9	G	Dunn	15:3¾	905	852½	52½	67	70	7½	8½
Pioneer	U.S.Remt.	Gr-Th	13	G	Ch.	15:2¾	1010	950	60	72½	73	8	9¼
Jessie	U.S. Morgan H. F.	Morgan	9	M	Ch.	15:1½	1025	985	40	70	71	8¼	9
Maud Hella	Morgan Horse Clb.	Morgan	12	M	Bay	15:¾	955	930	25	69	68½	8¼	8½
Eudora	H.S.Morgan H.F.	Morgan	14	M	Ch.	15:¼	985	940	45	71	71¼	7½	8½
El Sabok	U.S.Remt.	Arab	9	S	Ch.	15:1½	875	825	50	67	67½	7¾	8¼
Lady Luck	3rd U.S.Cav.	Gr-Th	9	M	Br.	15:2½	1095	1045	50	73	72½	8	9
Babe	3rd U.S.Cav.	Gr-Th	9	M	Bay	15:2¾	975	915	60	71½	70	8	8½
Major S	Maj. C. L. Scott	Gr-Morgan	9	G	Bay	15:3	1135	Out on	3rd day	after g	oing 3	8 miles.	
Sugar Plum	Capt. J. H. Irving	Th		M	Ch.			Out on	3rd day	after g	oing 1	5 miles.	
Gladstone	U.S. Morgan H. F.	Morgan	12	G	Bay			Out aft	er first d	ay—60	miles.		
Vanity Fair	101st Cav. N.Y.N.G.	Gr-Th		M	Ch.			Out aft	er first d	ay—60	miles.		

also enjoys the distinction of participating very creditably in the 1924 Olympic Games.

"Lillian Russell" was placed third. She is a grade Thoroughbred and finished third in the 1924 Ride.

"Rex Rysdyk," an American saddle-bred gelding, owned and ridden by Mr. R. T. M. McCready, was placed fourth. This is the first horse of his breed ever to finish an endurance ride in the East.

"Pioneer" won fifth place. He is a grade Thoroughbred and this is his first entry to the Endurance Ride.

"Jessie," a purebred Morgan, was placed sixth. This was Jessie's first entrance in an Endurance Ride.

The only other animals entered in this year's Ride, which have previously participated, were "Major S" and "Gladstone." Major S is a grade Morgan gelding, who finished fifth in 1923 and 1924, but was eliminated this year on the third day on account of lameness after going thirty-eight miles. Gladstone was withdrawn after the first day's ride on account of digestive troubles. This horse won second place in 1922 and finished the Ride in 1923, but was unplaced.

Other horses eliminated during the Ride were "Sugar Plum," who was eliminated on account of lameness at the 15-mile con-

TABLE I

	TIME (HRS.)	SCORE			PLACING
		SPEED	COND.	TOTAL	
Peggy	45	40	58	98	1
Pathfinder	45	40	56	96	2
Lillian Russell	45	40	53	93	3
Rex Rysdyk	45	40	50	90	4
Pioneer	45	40	49	89	5
Jessie	45	40	46	86	6
Maud Hella	45				Unplaced
Eudora	45 24 min.				Unplaced
El Sabok	45				Unplaced
Lady Luck	45				Unplaced
Babe	45				Unplaced

trol station, on the third day, and "Vanity Fair," who was eliminated at the end of the first day on account of high temperature, rapid pulse and refusal to eat, indicating a condition which made it unwise to continue this valuable animal in the Ride.

Major C. L. Scott received the prize of one hundred dollars in gold for showing the best horsemanship during the Ride.

Corporal Anthony Quatisky, rider of the winner, received the prize of $500 for bringing in his mount in the best condition at the end of the Ride.

Tables I and II give in condensed form the most important information concerning each horse entered and the score of the winners.

The original weights were taken on the forenoon of the day before the Ride commenced. The final weights were taken on the morning of the day after the Ride was finished.

Those who regularly attend these rides expressed the opinion that the 1925 Ride was the most successful that has been held in the East. It is regrettable that there were not more entries of privately-owned horses and it seems probable that the future success of these Rides will depend somewhat on whether or not individuals who breed or own suitable horses will enter them in the Ride.

CALIFORNIA VETERINARY CONFERENCE

The California Veterinary Conference will be held at University Farm, Davis, January 5-6-7-8, 1926. Among the veterinarians from out of the State who will contribute to the program are Dr. R. R. Dykstra, of the Kansas State Agricultural College, and Dr. J. A. Kiernan, of the U. S. Bureau of Animal Industry. Members of the veterinary staff of the University of California and the State Department of Agriculture will contribute freely to the program, assisted by a number of California's prominent practitioners. The afternoon and evening of Wednesday, January 6, will be given over to an adjourned meeting of the California State Veterinary Medical Association, at Sacramento.

What about This, Dr. Munce?

A bill passed by the Pennsylvania State Senate, requiring that milk be sold only in original containers, should certainly stimulate the live stock market.—*Detroit News.*

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

PRELIMINARY OBSERVATION ON INTRAPERITONEAL INJECTION OF BLOOD IN DOGS AS COMPARED WITH THE INTRAVENOUS INJECTION

By GREGORIO SAN AGUSTIN, MIGUEL MUNOZ AND MANUEL M. ROBLES

College of Veterinary Science, University of the Philippines Los Banos, Laguna, P. I.

Intravenous injection of blood or, in other words, blood transfusion, is being commonly practiced by physicians, but only in cases where immediate effects are desired. Some reasons for its infrequent use are the dangers accompanying the rather delicate technic of intravenous injection; the liability of producing hemolysis and blood-clots in the receiver's blood; and voluntary donors are not generally available.

In veterinary practice blood infusion is seldom resorted to, for the same reason mentioned above.

The following experiment was conducted at the College of Veterinary Science, University of the Philippines, during the summer vacation of 1925, covering a period of eighteen days.

MATERIALS AND METHOD

Six dogs were used in the experiment, three males and three females. For purposes of uniformity, the dogs were separated into three lots. One male and one female, of similar constitution, were placed in each lot. The healthiest dog and bitch, however, were put in the same lot, as controls. These experiment animals were given a uniform diet for three days, beginning March 21. They were fed morning and afternoon, with cooked rice and pork. Every morning they were taken out of their cages and given about 20 minutes' exercise.

To obtain the hemoglobin reading the Dare hemoglobinometer was used.

Experiment and Results

The object of the experiment was to determine the rate of absorption of the hemoglobin in the intraperitoneally-injected blood, as compared with the intravenous.

On March 24, the first hemoglobin reading was made and it was continued for three consecutive days. (See table I.)

Table I—*Hemoglobin readings*

Dog	March											Method
	Daily hemoglobin reading			Avg.	27			28	29	30	31	
	24	25	26		After injection							
					1st hr.	2nd hr.	3rd hr.					
1	79	81	74	78	61	61	59	56	56	52	51	Intraperitoneal*
2	76	80	82	79	72	72	69	68	56	59	60	Intraperitoneal
3	93	90	88	90	88	79	76	70	78	87	86	Intravenous
4	76	82	79	79	69	61	68	61	62	70	69	Intravenous
5	85	70	70	79	69	61	61	61	75	72	67	Control
6	90	78	86	85	77	74	70	58	79	85	72	Control

	Avg.	April										
		1			2	3	4	5	6	7		
		After Injection										
		1st hr.	2nd hr.	3rd hr.								
7	90	71	74	70	53	77	74	74	74	62		Intraperitoneal
8	79	53	53	58	62	57	58	59	62	59		Intraperitoneal

On March 27, all the animals were bled. Blood in the amount of 3 per cent of the body weight was taken from each animal. The bleeding was done with a hypodermic needle, after exposing the femoral artery. The artery was ligated and interrupted sutures applied to the skin wound, immediately after bleeding. The blood withdrawn from dogs 1, 2, 3 and 4 was discarded, while that from dogs 5 and 6 was collected in a sterile Erlenmeyer flask. A 2 per cent solution of sodium citrate was mixed with the blood, one quarter by volume.

For the intraperitoneal injections and intravenous transfusion the citrated blood from dogs 5 and 6 was used. The amount used in each injection and transfusion is shown in table II. It

TABLE II.—*Showing amount of blood taken from each dog and amount of blood injected or transfused*

DOG	WEIGHT (KG.)	AMT. OF BLOOD TAKEN (3% OF BODY WEIGHT) SP. GR. 1055 (CC)	AMT. OF BLOOD INJECTED (CC)	MANNER OF HANDLING
1	6.1	174	87	Intraperitoneal injection
2	7.1	203	102	Intraperitoneal injection
3	5.8	166	83	Intravenous transfusion
4	7.8	223	80[1]	Intravenous transfusion
5	10.0	286	None	Control
6	12.4	354	None	Control
7	5.8	166	83	Intraperitoneal injection
8	7.8	223	112	Intraperitoneal injection

[1]Amount is less than one-half of the amount of blood lost.

should be noted that dog 3 received a proportionately smaller amount of blood. This was due to lack of citrated blood, because the second dilution that was made coagulated before it was mixed.

Dogs 1 and 2 received the intraperitoneal injection at a point just posterior to the umbilicus, in the median raphe. This region was chosen because at this place the parietal peritoneum is adherent to the abdominal wall. Antiseptic precautions were taken in the process of injection as well as during the bleeding.

Dogs 3 and 4 were transfused through the right external jugular veins. The wounds made for the exposure of the external jugular vein were properly sutured.

The hemoglobin reading was taken for each animal just after bleeding. Dogs 1 and 2 received the intraperitoneal injection and dogs 3 and 4 the intravenous transfusion. The hemoglobin

reading of all the dogs, including the controls, were taken hourly for three consecutive hours. (See table I.)

From March 28 to 31, daily hemoglobin readings were taken. (See table I.)

On April 1, dog 2 died of peritonitis, as revealed in the post-mortem findings.

Dog 1 was destroyed for an examination of the abdominal cavity. It was found to perfectly free from all traces of the injected blood.

On April 1, to repeat the intraperitoneal injection, we used dogs 3 and 4 and numbered them 7 and 8. Blood was obtained from dogs 5 and 6. These dogs were subsequently destroyed. The intraperitoneal injection was repeated, to verify the results in the first two dogs. Hemoglobin readings were also taken before injection.

The amount of blood taken from and injected in each animal is shown on table II. The same plan was followed in obtaining the record of the hemoglobin reading in the former observation. (See table I.)

Conclusion

The intravenous transfusion was found to be more effective. The rise of the hemoglobin reading was faster and it attained its normal reading on the fourth day, while in the intraperitoneal injection four dogs that received it had their hemoglobin decreased until the last day, when they were destroyed.

Therefore, in cases where blood has to be injected to make up losses, either from hemorrhage or from diseases causing destruction of corpuscular elements in the blood, intraperitoneal injection should never be resorted to, because rather than help increase constitutional vigor, it depresses the vitality with attending danger of causing peritonitis.

A COMPLIMENT FROM A PHYSICIAN

At the triennial general convention of the Protestant Episcopal Church of America, Dr. W. Sinclair Bowen, of Washington, D. C., a fellow of the American College of Surgeons, declared that in his practice, extending over forty years, he had found that physicians had not kept pace with veterinarians in the field of preventive medicine. Dr. Bowen is reported to have said: "Our women are not offered, in some respects, as much protection as is given to cows and horses in well-regulated dairies and stables."

REVIEW

VETERINARY DIAGNOSIS AND TREATMENT. G. E. Jorgenson, D. V. M. 340 pages. D. Appleton & Co., New York, 1925. Cloth, $3.50.

Dr. Jorgenson's book seems to be a practitioner's determination to show that the microscope and test-tube are as much needed in the veterinary armamentarium as the scalpel and bistoury. It seems to imply forcibly that when the physical examination has been made, all of the resources available in arriving at a diagnosis have by no means been exhausted; and this without insisting upon the practicability of the methods described under average circumstances and conditions, for behind all of blood-counting, microscopic examinations of bacteria, tissues and fluids, urine analyses, etc., mentioned throughout the text, there are visions of all the hardships and obstacles encountered in a country practice.

Veterinary Diagnosis and Treatment is a record of case reports. The author selected 132 typical cases out of a total of 1200 during the last ten years and has recorded the date, species, age, sex, anamnesis, objective symptoms and laboratory findings of each case, antemortem and postmortem, and then discusses how a careful analysis of all the obtainable evidence was interpreted in making the diagnosis.

As the book, by its very nature, is like a colleague called in consultation, the reader will find a lot of highly instructive pleasure in seeking out the fine points wherein the author may have erred, for it is a record of opinions as well as tangible findings.

There is good reasoning throughout, but the author is at his best in heart pathology, having apparently made a special study of the diseases of that organ and of its behavior in other organic aberrations, and records some auscultatory findings more familiar to the physician than the veterinarian, our teachings having been very lame in that connection.

The present writer does not pretend either to evaluate or discredit the evidence furnished a veterinary practitioner by blood-counts of single cases of the more common ailments of animals but, for those who are curious, there it is between the covers of a book of ready reference for the first time.

Veterinary Diagnosis and Treatment is a toboggan in the realm of practice. Practitioners will enjoy reading it.

Faults? Flaws, rather than faults, are numerous enough. The proof-reader has allowed errors to creep in that should have been "caught." A horse, fully recovered from a febrile disease, is described as having a temperature of 108.8° Fahrenheit and another showed an erythrocyte count of 600,000,000. Orthographic and typographic errors were poorly checked, and the author made the unfortunate mistake of not obeying the common rules of prescription-writing and also of featuring purely medical treatment to the almost total exclusion of other ministrations.

L. A. M.

ABSTRACTS

ON THE ALLEGED SYNERGISM OF MAGNESIUM SULPHATE AND MORPHINE WHEN INJECTED PRIOR TO THE INDUCTION OF ANAESTHESIA BY THE ETHER-OIL COLONIC METHOD. Harry Beckman. Jour. Lab. and Clin. Med., x (1924) 3.

Various authors have reported upon the apparent anesthetic properties of magnesium sulphate and its alleged value in increasing the effectiveness of morphin when injected hypodermically along with the latter drug. Much of the data upon which these observations were founded were of a clinical nature, having to do with the control of the insane and the production of painless child-birth.

In order to check these studies on a purely experimental basis, Beckman undertook two series of experiments upon dogs: (a) the use of morphin alone, prior to the induction of anesthesia by the ether-oil colonic method of Gwathmey; and (b) the use of morphin and magnesium sulphate injections prior to the same type of anesthesia. The purpose in (a) was to determine the amount of ether-oil mixture necessary for satisfactory anesthesia and the purpose in (b) was to determine if the amount of ether-oil mixture could be materially reduced on account of the synergistic action which the magnesium sulphate was supposed to exert upon the morphin, and also to observe any deleterious action of the magnesium sulphate if such should arise.

The conclusions reached in the first series of experiments were: "One ounce of a mixture of 75 per cent ether and 25 per cent olive oil per twenty pounds body weight, introduced into the colon of dogs one hour after the subcutaneous injection of ¼ cc of a 4

per cent solution of morphin solution per kilogram of body weight, is effective in inducing safe and very satisfactory surgical anesthesia and in maintaining same for a little more than one hour." (For the exact method and other details, see the JOURNAL of the A. V. M. A., for July, 1925, pp. 522-528.)

In the second set of experiments, the method was the same except that, in addition to the preliminary injection of morphin, there were also injected 2 cc of a 50 per cent solution of magnesium sulphate. Then, at the end of one hour, one ounce of the ether-oil mixture per forty pounds of body weight was introduced into the colon (one-half the amount found to be effective and satisfactory in the first experiments).

The results obtained were unsatisfactory; the animals did not become completely insensitive, complete relaxation was not obtained and recovery from the anesthetic was delayed and attended with objectionable symptoms.

In discussing the experiments, the author points out that the synergistic action of the magnesium sulphate was not established, although the amount of ether-oil mixture used in the second series may have been reduced too radically. On the other hand, it is concluded that the subcutaneous injection of 2 cc of a 50 per cent solution of magnesium sulphate along with ¼ cc per kilogram of a 4 per cent morphin sulphate solution injected into dogs and followed by the ether-oil mixture (one ounce to forty pounds body weight), gives rise to respiratory symptoms and a general depression which are undesirable.

J. G. H.

THE ALLEGED SYNERGISM OF MAGNESIUM SULPHATE AND MORPHIN. Harry Beckman. Jour. of A. M. A., 85 (1925), pp. 332-336.

This is a continuation of the author's previous studies, together with a review of some of the controversial aspects of the subject. Nothing of particular note is added to the previous study except some slight alterations in methods employed, the results of the experiments supporting still further the author's contention that the alleged synergism between magnesium sulphate and morphin does not take place in dogs. This conclusion is reached after experiments which indicated that neither the effective dose of morphin nor the effective dose of ether-oil mixture for satisfactory anesthesia could be reduced by employing hypodermic injections of 50 per cent magnesium sulphate.

J. G. H.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

First Lieutenant John R. Ludwigs, Seattle Q. M. I. D., Washington, promoted to rank of captain, effective September 26, 1925.

First Lieutenant Lester W. Ingram relieved from duty at Presidio of San Francisco and directed to report to Commanding Officer, Fort Bliss, Texas, for duty on or about February 10, 1926.

Second Lieutenant Ernest E. Hodgson, on temporary duty Front Royal, Virginia, relieved from duty at Medical Field Service School, Carlisle, Pennsylvania, and directed to report to Commanding Officer, Front Royal Q. M, I. D., for permanent duty.

Captain Stanley C. Smock assigned to duty at Presidio of San Francisco effective on completion of his tour of duty in the Hawaiian Department on or about February 6, 1926.

Captain Allen C. Wight relieved from duty at Fort Logan, Colorado, and from additional duty as attending veterinarian, Fitzsimmons General Hospital, effective on or about October 15, and directed to report to Commanding General, Fort Sam Houston, Texas, for duty.

Captain Claude F. Cox assigned to duty at Fort Sam Houston, Texas, effective on completion of his tour of foreign service in the Phillippine Department, on or about February 19, 1926.

Captain Seth C. Dildine relieved from duty at Fort Sam Houston, Texas, effective in time to sail on transport due to leave on or about January 27, 1926, for Philippine Islands, and directed to report to Commanding General, Philippine Department, for duty.

Veterinary Reserve Officers

Additional Reserve Officers

First Lieutenants:

Jespersen, Edward Christian.1129 Fratney Street, Milwaukee, Wisconsin.
Kitzhofer, Joseph H.....210 Fenton Avenue, Grand Forks, North Dakota.
Williams, Clarence V.....Box 55, Big Horn, Wyoming.

Second Lieutenants:

Boyce, McKeen.....State Street, Vanport, Pa.
Paul, Haven Tilton.....290 Woodbury Avenue, Portsmouth, New Hampshire.

ANOTHER ONE ON DAD

A little boy was once overheard saying to his pet rabbit:

"How much is seven times seven?"

There being no response from the rabbit, the boy said:

"How much is four times four?"

Still there was no response.

"Now I will give you an easy one. How much is two times two?"

Still the rabbit refused to respond.

"Well," said the boy, "I knew father was fibbing when he said rabbits are the greatest multipliers in the world."

—*Exchange.*

LEGISLATION AFFECTING VETERINARIANS YEAR 1925

(See similar summary in JOURNAL, December, 1923)

ALABAMA:

No legislation.

ARIZONA:

No legislation. $80,000 appropriated for tuberculosis eradication for biennium.

ARKANSAS:

No legislation except a law which granted the right to about ten non-graduate practitioners to practice in their respective counties.

CALIFORNIA

General Infectious Disease Act amended to provide payment for animals and property destroyed in order to suppress certain destructive infectious diseases and to provide penalties for violations thereof.

A law was enacted delegating to the State Department of Agriculture police power in the control and eradication of transmissible poultry diseases.

The following bills were passed by both houses, but were not signed by governor:

Bill intended to facilitate the eradication of bovine tuberculosis.

Bill providing for counties to pay indemnity to owners of any cattle pursuant to law in a tuberculosis-eradication area.

Bill to provide a new act to regulate the practice of veterinary medicine in California.

COLORADO:

Bill enacted providing for cooperation between the State Veterinary Surgeon's department and the U. S. Bureau of Animal Industry, and cities and municipalities of the State, in the control or eradication of bovine tuberculosis, and appropriating $25,000 for this work for the biennium.

CONNECTICUT:

The Veterinary Practice Act was amended in a number of particulars, which add considerable strength to the act.

A law was passed providing for the examination of flocks of poultry for disease, upon application to the Commissioner on Domestic Animals, free of expense to the owners of flocks of over 100. The examination includes blood tests for bacillary white diarrhea. The law provides for regulations concerning poultry diseases, requires a permit for the importation of poultry into Connecticut for slaughter, and an examination on arrival by an assigned veterinarian, at the expense of the owner.

An amended act provides that the Commissioner on Domestic Animals may make, subject to the approval of the Governor, orders and regulations concerning the importation, transportation, trailing, riding, traveling, examining, testing, quarantining, or disposal of domestic animals, for the protection of live stock from contagious and infectious diseases, and for the protection of the public health from such diseases as may be transmissible to human beings, either directly or through the products of such domestic animals.

An amendment was made to the act concerning the examination of domestic animals, upon the request of the owner. This applies more specifically to tuberculosis and provides for the issuing of a certificate, if the animal or animals be found free of disease, or for quarantining, marking, or branding, if the animal or animals react.

An act was passed regulating the sale of milk from diseased cows. Persons who sell, or expose for sale, milk or any milk product, from a cow which is emaciated or diseased, are made liable to a fine of not more than $25.00, or

imprisonment for not more than 30 days, or both, under conditions which provide for the examination of the animals, etc.

An act was passed providing for the establishment of accredited herds, the State cooperating with the federal government in testing, condemning, appraising, examination and disposition.

An act was passed revising and codifying the dog laws.

Other laws govern the importation of equines, providing rules and regulations in connection with the control of glanders. Another law refers to the regulations governing the importation of swine and the eradication of hog cholera, hemorrhagic septicemia, and kindred diseases. Anti-hog cholera serum or hog cholera virus may not be shipped into the State except on written permission issued by the Commissioner or the Deputy Commissioner, and no person other than the Commissioner or his assistant shall administer any such serum, virus, or other preparation without written permission from the Commissioner. The use of so-called cholera cures is strictly prohibited and a penalty is provided.

DELAWARE:

Appropriations for animal disease control work as follow: Tuberculosis eradication, $40,000 per year; poultry diseases, $5,000 per year; other diseases, $5,000 per year; free hog cholera serum and virus, $7,000 per year; poultry disease investigation (Purnell Fund) $2,000 per year.

FLORIDA:

Veterinary Practice Act passed, providing for a state board of veterinary examiners. Examination fee, $10.00; annual registration fee, $1.00.

Appropriation of $44,650 per year, for the eradication and control of hog cholera and tuberculosis, provides for employment of ten veterinarians and ample funds for indemnities for tuberculous cattle. Also an appropriation of $235,000 for tick eradication and control.

GEORGIA:

Appropriations: Tick eradication, $50,000 per annum; hog cholera control, $10,000 per annum; other contagious diseases, $6,000 per annum; inspection of slaughter-houses, dairies, meat and milk products, an indefinite sum, depending on amounts available in what is known as the Pure Food Fund.

For the construction of a quarantine line fence, on the state border between Georgia and Florida, $100,000. This fence, almost 200 miles long, is nearly completed. It is a double fence, the lines being ten feet apart, each of five strands of barb wire. There is not a single gate in the entire line. Public highways are supplied with cattle guards, consisting of a deep pit, covered by a grating of 2 x 8 timbers, six inches apart, allowing the passage of automobiles. The construction of this fence was necessary to protect Georgia from reinfestation with cattle ticks from the tick-infested areas of Florida.

IDAHO:

An appropriation of $46,800 for disease control. Of this sum approximately $25,800 is to be used for tuberculosis eradication, veterinary education, research and experimental work.

The 1923 legislature made it possible for county commissioners of Idaho to cooperate with the Federal and State Bureaus of Animal Industry in making a reasonable county appropriation to aid in tuberculosis eradication in their respective counties under the county area plan. Since this law was enacted the Bureau of Animal Industry has completely tested all of the dairy-type animals in thirteen counties in Idaho, approximately 190,000 head of cattle. By December 15, 1925, there will have been completely tested all of the live stock, bovine species, in the three northern-most counties, which include Kootenai, Bonner and Boundary, and Idaho will then enjoy the largest tuberculosis-free area in the United States, containing approximately 35,000 head of cattle.

ILLINOIS:

An act was passed providing for the eradication of bovine tuberculosis by means of quarantine and otherwise, and providing penalties for violations of the provisions thereof.

INDIANA:

A law passed pertains to the tuberculin testing of cattle under what is known as the county area plan, and authorizes county councils, upon presentation of a petition signed by not less than fifty-one per cent of the cattle owners of the county, to make an annual appropriation of not to exceed $5,000 for the purpose of assisting the state and federal authorities in applying the tuberculin test to all cattle within the county. It provides further for the employment of inspectors and the payment of a portion of their salaries and all their expenses while engaged in this work. Also, that when seventy-five per cent of the cattle in any county have been tuberculin tested, it then becomes mandatory upon the owners of the remaining twenty-five per cent to submit their cattle to a tuberculin test under such supervision. It provides for the branding and tagging of reactors, their slaughter and the enforcement of quarantine regulations, and provides penalties for the violation of any of the provisions of the act.

Another law was passed regulating the sale and distribution of milk, prohibiting such sale or distribution unless the milk has been pasteurized, except that the provisions of this act shall not apply to any person, firm or corporation selling milk for household use from cows that have been tuberculin tested annually.

IOWA:

No legislation other than minor amendments to the acts pertaining to tuberculosis eradication and veterinary practice.

Accredited veterinarians are being employed, on per diem ($10.00 and seven cents per mile for use of auto) basis, in tuberculosis eradication work. During the past year as many as two hundred practitioners have worked from two to four days a week.

KANSAS:

Appropriations for the State Live Stock Sanitary Commission: Animal disease control, $58,300 for the biennium; tuberculosis eradication $20,000 for the biennium. For the Veterinary Department of the Kansas State Agricultural Experiment Station: Abortion disease investigation, $5,800 a year; miscellaneous animal disease investigation, $670.

The 1925 legislature set aside 90 per cent of all fees collected from veterinarians to be used by the State Board of Veterinary Examiners as their judgment dictates. The other 10 per cent is to be retained by the State Treasury, to cover expenses of printing, etc.

KENTUCKY:

Live stock indemnities reduced. Equines, from $100 to $50; registered bovines, $200 to $100; grade bovines, $100 to $50.

LOUISIANA:

The 1924 legislature passed a measure providing indemnity for animals destroyed on account of glanders, the State to pay one-third of the appraised value and the county one-third.

An appropriation of $35,000 per year was made for all sanitary control work.

MAINE:

Appropriation of $75,000 per year for the Maine Bureau of Animal Industry, of which $65,000 is for tuberculosis eradication.

Law passed authorizing the Commissioner of Agriculture to quarantine a county for purposes of tuberculosis eradication.

MARYLAND:

Appropriation of $125,000 per year for three years as an indemnity fund for tuberculous cattle. Expenses paid from other items in the budget.

MASSACHUSETTS:

An act passed March 28, 1924, requires veterinarians to tag all cattle which react to tuberculin, and fixes a penalty of $100 or imprisonment for not less than thirty days for any person who removes any such tag or who in any way

disposes of any animal which has reacted to a tuberculin test except for the purpose of immediate slaughter, the same penalty applying to any person who neglects or refuses to have slaughtered a reacting animal sold to him for that purpose.

An act, approved April 28, 1924, restored to the statute books a law repealed in 1922, under which indemnity is paid to an amount not exceeding $25.00 for any physical case of tuberculosis condemned and killed by order of the Director of Animal Industry.

An act passed on June 5, 1924, provides for a fine of not more than $200 on anyone who transports, into the Commonwealth of Massachusetts, cattle for dairy purposes unless they have been inspected and passed as healthy by a United States B. A. I. inspector or an approved veterinarian in the state where shipment originates.

Appropriation of $200,000 to be used in the payment by the Commonwealth of indemnity for cattle which react to the cooperative test, expenses of operation to be paid out of the General Fund appropriated for the uses of the Division of Animal Industry in the control and eradication of contagious diseases of animals.

MICHIGAN:

The section of the law relating to the payment of indemnities for tuberculous cattle has been amended, to provide that the indemnity paid for any one animal shall not exceed the difference between the appraised value and the amount received for salvage. This change was aimed to prevent the owner of a tuberculous animal receiving more for the animal than it was actually worth. Incidents of this kind have occurred occasionally in the past.

The power was given boards of supervisors to appoint a competent person to be known as County Live Stock Agent, upon the nomination of the Commissioner of Agriculture. It is understood by all concerned that the competent person shall be a fully qualified veterinarian. In the old law, provision was made for the appointment of a County Live Stock Agent but it was specified that in the event of a County Agricultural Agent being employed in a county, that such agent should automatically take over the duties of the County Live Stock Agent and no other live stock agent would be appointed. The possibility of a County Agricultural Agent taking over the duties of the County Live Stock Agent has been eliminated.

The legislature provided $500,000 to be used in paying indemnities on tuberculous cattle during the two fiscal years ending June 30, 1927, and approximately $40,000 for each of the two years was provided for the Bureau of Animal Industry for operating expenses.

Several minor changes were made in the dog law and one outstanding change relating to the disease of rabies provides that in the event of a person being bitten by a rabid animal, or in any other way inoculated with the virus of rabies, that the county shall pay the expenses of the Pasteur treatment, not to exceed $200 per person.

Act 188 provides that poultry shall be included in the term "live stock."

MINNESOTA:

Two laws were enacted that are of special interest to the live stock industry and the veterinary profession. One of them makes it unlawful for any person to sell any class of cattle at public auction, mortgage-foreclosure sale or any sale by order of any court, unless the same have passed a satisfactory tuberculin test, made according to the rules and regulations of the State Live Stock Sanitary Board and a certificate of such test exhibited at the time of sale. This law also provides that if any auctioneer knowingly makes any sale of cattle in violation of this law, upon conviction thereof, he will forfeit his license as an auctioneer. There has been a law in Minnesota since 1910 requiring that all pure-bred cattle must have passed a satisfactory tuberculin test before they can be sold at either private or public sale.

There was also a law enacted making it unlawful for any person to exhibit cattle at state or county fairs, or any public exhibition or show, unless the same have passed a satisfactory tuberculin test, made according to the rules and regulations of the State Live Stock Sanitary Board.

The laws of the State were amended in order that the Live Stock Sanitary Board may be able to cooperate legally with the U. S. Bureau of Animal Industry in the control of foot-and-mouth disease and making it possible whereby the State will stand one-half of the appraised value of the animals that it may be necessary to destroy and also for any property damages.

There were also some amendments relative to the payment of indemnity for cattle that may be condemned for tuberculosis. The important changes were as follow: No indemnity shall be paid for (1) steers; (2) animals which have not been kept for one year, or since their birth, in good faith, in the State; (3) animals brought into the State, or from one county into another within the State, contrary to any provision of law or rules and regulations of the State Live Stock Sanitary Board; (4) animals diseased at time of arrival in this State; (5) animals belonging to the United States; (6) animals belonging to institutions maintained by the State, or any county or municipality; (7) animals which the owner or claimant knew to be diseased or had notice thereof at the time they came into his possession.

No indemnity shall be paid when (8) the owner has received indemnity as a result of a former inspection or test and has therefore introduced into his herd any animal which had not passed the tuberculin test; (9) the owner or agent has not complied with the rules and regulations of the State Live Stock Sanitary Board with respect to animals condemned; (10) the condemned animals are not destroyed within sixty days, except in the case of tuberculosis, when they may be kept 150 days after they have been determined to be affected with tuberculosis and during such period have not been kept under quarantine and isolated from healthy animals, except in counties where the control of tuberculosis is under the area plan, then indemnity will not be paid unless all condemned animals are slaughtered within thirty (30) days after the test or condemnation.

No indemnity shall be paid for (11) the destruction of any live stock affected with tuberculosis or glanders, unless the entire herd of which such affected live stock is a part, or from which such affected live stock has originated, shall be examined and tested under the supervision of the Board, in order to determine if they are free from such disease; (12) the destruction of any live stock affected with tuberculosis or glanders, unless the owner has carried out the instructions and regulations of the Board relating to the cleaning, disinfection and rendering the stables and premises in a sanitary condition, within thirty days from the time of removal of such animals from the premises, except when, because of inclement weather or other extenuating circumstances, the time may be extended by the executive officer of the Board; (13) the destruction of any live stock affected with tuberculosis, if the owner has fed milk or milk products derived from creameries and which have not been properly pasteurized as required by state laws and regulations.

No indemnity shall be paid if (14) at any time the annual appropriation for payment of indemnities becomes exhausted as a result of condemnation and slaughter of animals, the State Live Stock Sanitary Board shall discontinue making further official tests or to authorize such tests, with the exception that if the owner signs a waiver on blanks to be furnished by said Board, for payment of indemnity for any animal that may be condemned as the result of a test and inspection, and releasing the State from any obligation to pay indemnity from any future appropriation.

Appropriations for the work of the Live Stock Sanitary Board for the biennium were: Salaries, $45,000; Contingent Fund, $20,000; indemnity for animals killed for tuberculosis, glanders, and as a result of the treatment in preventive vaccination for anthrax (when ordered by this Board), $250,000; indemnity for tuberculous cattle under the area plan, $250,000. This represents an increase of $5,000 annually for Contingent Fund and $5,000 for salaries; and an increase of $150,000 annually for the Area Indemnity Fund; and an increase of $50,000 for the General Indemnity Fund.

MISSISSIPPI:

No report.

MISSOURI:

A law was passed enabling the state veterinarian to declare a modified accredited area, which may be summarized as follows: Whenever seventy per cent or more of the cattle owners of any county have had their cattle tuberculin tested, or submit a petition for such testing to be done, the state veterinarian is empowered, after a legal hearing, to declare the said county a modified accredited area and to draft such regulations as are necessary to fulfill the statute.

The State now has one modified accredited area under the new law.

MONTANA:

No legislation directly pertaining to live stock sanitary control work, but several laws were passed pertaining to brand inspection, prohibiting bulls from running on the open range at certain times of the year, and the gathering of wild horses.

The legislature appropriated $51,000 per annum from the General Fund, and the Livestock Sanitary Board also receives moneys collected from a direct tax on live stock. The tax this year has been placed at one mill on all live stock in the State.

NEBRASKA:

Law passed authorizing the Department of Agriculture to establish areas for tuberculosis eradication, when petitioned by sixty per cent or more of the owners, representing fifty-one per cent of breeding cattle, in a county. Making test compulsory after area is established and provides penalty for refusal to test. The county will bear certain expenses of the work, not to exceed fifteen cents for each animal tested.

Fifteen per cent of the fund for tuberculosis eradication may be used for accredited herd work outside of established areas.

Any indemnity for glandered horses is to come from the appropriation for tuberculosis eradication.

The stallion registration law was repealed.

Two hundred and eighty-five thousand dollars was appropriated for tuberculosis eradication, $20,000 for scabies control work, $6,000 for swine disease control work, for the biennium.

The Animal Pathology Department of the College of Agriculture, University of Nebraska, has in the neighborhood of $10,000 for research and experimental work.

A bill introduced to regulate veterinary practice in Nebraska failed to become a law.

NEVADA:

No new legislation.

The legislature of this state does not ordinarily make specific appropriations for live stock disease control work, revenues for this purpose being derived from three more or less permanent but flexible tax levies. During the last two years the amount of such funds expended has been unusually large owing to heavy expenditures in connection with quarantine enforcement work on account of pressure of foot-and-mouth disease in California, a neighboring state, during 1924. In order to help make up a deficit created by this unusual expenditure, the 1925 legislature made a special appropriation of about $22,000. The total expenditures by the State for animal disease control work during the last two years has been approximately $200,000.

NEW HAMPSHIRE:

A section was added to the law, providing that when sixty-five per cent of the cattle owners in any given county or town apply for the tuberculin test, or when seventy-five per cent of the cattle in a county are under state and federal supervision, the Commissioner may declare a quarantine area and proceed to test all animals in the said area.

The legislature appropriated $150,000 a year for the next two years to carry on the work of the Department of Animal Industry. The major portion will be used in the tuberculosis-eradication program.

NEW JERSEY:

An act was passed providing for the prevention of the spread of communicable, infectious or contagious diseases in poultry, and for regulating the handling of poultry.

The act of March 29, 1916, was amended so as to give the Department of Agriculture power to determine the existence of contagious and infectious diseases of poultry as well as in other animals.

NEW MEXICO:

Law passed providing that all cattle intended for dairy or breeding purposes which may be brought into the state of New Mexico must be accompanied by a tuberculin test certificate issued by a qualified veterinarian attesting the freedom of such animals from tuberculosis, and that such cattle must be held in quarantine for a period of three months, after which they are to be again tested by a qualified veterinarian, authorized by the Cattle Sanitary Board of New Mexico to perform such tests, and if found free from tuberculosis are then to be released from quarantine.

NEW YORK:

An amendment to the 1924 law was made in April, 1925, so that the regents may, in their discretion, admit to the veterinary examinations graduates of duly incorporated veterinary schools, who matriculated in such schools prior to 1912, instead of 1910, as previously provided.

The legislature appropriated $2,000,000 in the spring of 1925 to pay indemnities from July 1, 1925, to January 1, 1926. It was understood that an additional $2,000,000 would be appropriated for indemnities from January 1, 1926, to July 1, 1926, making a total of $4,000,000 for the twelve months.

NORTH CAROLINA:

A law was enacted providing for $20,000 for indemnity on tuberculous cattle and $60,000 for tick eradication for the two-year period ending July 1, 1927.

There has also been enacted a State Meat Inspection Law and the State Department of Agriculture has recently issued meat inspection regulations which closely follow federal regulations.

NORTH DAKOTA:

The legislature made an appropriation of $126,850 to provide for all activities of the Live Stock Sanitary Board for the next two years. Of this amount about $100,000 is available for services and expenses incurred in the eradication of tuberculosis, the balance being available for controlling other contagious diseases of live stock.

A law was also established providing that, where a majority of the live stock owners in any township sign a petition for the tuberculin testing of all the cattle in such township, the Board is authorized to enforce the test. After a majority of such townships in the county have been tuberculin tested, the Live Stock Sanitary Board is authorized to enforce the testing of all the cattle in the balance of the county.

OHIO:

A law was passed providing for the control and eradication of bovine tuberculosis. Under the law any herd owner may petition the Department of Agriculture for a tuberculin test. All cattle passing the test must be tagged in the right ear; registered cattle are identified by name and number. All tests must be reported within seven days. All reactors must be tagged in the left ear and branded on the left jaw. Reactors cannot be moved for any purpose except upon permit. A special feature of the law provides a definite plan under which cattle owners in a township or county may petition the Department of Agriculture for the area plan of testing. Such a petition is recognized when it is signed by a majority of the herd owners who own 75 per cent of the cattle. When 90 per cent of the cattle in the area have been tested the remaining 10 per cent must be tested. The law provides heavy penalties for altering or changing an ear-tag or for interfering in any way with the identification of reactors.

A new Veterinary Practice Act was passed, considered to be a great improvement over the old act. The strong features of this law were commented upon editorially in the JOURNAL for May 1925.

A law was passed providing that the laboratory equipment, land, buildings, and other facilities at the State Serum Institute, at Reynoldsburg, be placed under the direct supervision of the Department of Agriculture, to be used in cooperation with the Ohio Experiment Station, at Wooster, in cooperative research and experimental work in the diseases of domestic animals and poultry. This law does not in any way interfere with the laboratory diagnosis work, or the production of biological products, already being carried on by the Department, or any special investigations that may be deemed advisable. A limited amount of anti-hog cholera serum will continue to be made each year to supply the demand of the state insitutions. It is believed that no state should conduct and maintain a serum plant on a purely commercial basis. The plant will be kept in such shape that production of serum could be readily increased in the event of an emergency.

Appropriations for the control, prevention, and eradication of infectious and contagious diseases of animals were as follow: $700,000 as an indemnity fund for compensating owners of tuberculous cattle; $100,000 for operating expenses in connection with all of the activities of the Division of Animal Industry of the Department of Agriculture; $2,000 for laboratory experimental work. All appropriations were for the biennium.

OKLAHOMA:

No report.

OREGON:

Appropriations made: $20,102 for maintenance of the State Live Stock Sanitary Board; $32,222 for indemnities, which amount is matched by the counties.

County Herd Inspection laws were passed in Washington, Josephine, Lane and Benton counties. These laws provide for the employment of a veterinarian to test all of the bovine animals in these respective counties, making a charge of thirty-five cents per head, which moneys are duly receipted for and turned in to the County Treasurer's office for maintenance of the office of County Herd Inspector. The herd inspectors are paid a per diem.

The legislature passed what is known as the West Cascade Supplementary Tuberculin Test Law, making it obligatory on the part of each county in the west Cascade district of the State, which did not already have a county herd inspection law, to appoint a County Herd Inspector. A charge of twenty-five cents per head was to be made for each bovine animal tested, which is to be turned in to the County Treasurer's office and goes for the benefit of the County Herd Inspection Fund.

Provision was also made for the employment of a veterinarian to do investigational work on diseases of poultry and to be under the direction of the Oregon Agricultural College, at Corvallis. Five thousand dollars was appropriated for the carrying on of this work for the years 1925 and 1926.

Appropriation of $10,000 made for the investigation of infectious diseases of cattle at the Experiment Station of the Oregon Agricultural College.

PENNSYLVANIA:

No new legislation.

The legislature appropriated, for the biennium, $2,099,000 for tuberculosis and glanders indemnity; also $750,000 for the maintenance of the Bureau of Animal Industry, Pennsylvania Department of Agriculture.

In addition, $450,000 was appropriated for the enforcement of the Dog Law, including damages paid to owners of live stock and poultry suffering damages by dogs.

The above appropriations were for the two-year fiscal period beginning June 1, 1925, and ending May 31, 1927.

RHODE ISLAND:

No legislation.

SOUTH CAROLINA:

No new legislation.

The legislature appropriates $70,000 per year for operating expenses and $3,000 per year for indemnity. The latter amount can be increased, if necessary by the Budget Commission.

SOUTH DAKOTA:

The legislature passed a Reorganization Bill providing for a Department of Agriculture under which the Division of Animal Industry is a part.

There was also passed Senate Bill 85 providing for tuberculosis eradication under the county area plan.

Another law relating to the importation of sheep which requires all sheep imported into the State for breeding purposes to be quarantined until dipped under supervision of an approved veterinarian.

An annual appropriation of $45,000 was made for indemnities and general disease control work.

TENNESSEE:

The legislature appropriated $27,000 for the biennial period ending June 30, 1927, for all expenses of the Division of Animal Disease Control.

Counties have the right to appropriate any amount they wish for tuberculosis eradication work. The indemnity funds are unlimited, as each county has to pay all indemnities from its general funds.

A bill was passed providing for accrediting poultry flocks, hatcheries and baby chicks, under the direction of the state veterinarian.

Several bills failed that were intended to qualify or license non-graduate veterinarians.

TEXAS:

No legislation.

Appropriations made: $15,000 per year for indemnities for tuberculous cattle; $8,000 for special infectious disease investigation; $1,500 per year for laboratory maintenance.

UTAH:

No legislation.

VERMONT:

No legislation except the passage of an area test law. This provides that when ninety per cent of any given area signs a petition and sends same to the Commissioner of Agriculture, the area shall be given a tuberculin test of all cattle. If any of the remaining ten per cent fails to submit his herd, while the area test is being conducted, his farm and cattle are quarantined, which prohibits his selling or moving any animals from his farm until a satisfactory tuberculin test has been applied to the herd. This law carried an appropriation of only $5,000 yearly for the biennial period ending July 1, 1927.

The Department of Agriculture also has a biennial appropriation of $100,000 per year for the eradication of tuberculosis in cattle which does not include the $5,000 extra for area work.

VIRGINIA:

No report.

WASHINGTON:

Appropriation of $30,000 made for finishing tuberculosis eradication work under way, including indemnities and expenses of testing.

WEST VIRGINIA:

Appropriations made: $10.000 for diseased animals; $35,000 for tuberculosis eradication. The payment of indemnities for tuberculous cattle is divided as follows: The State pays one-fourth, the county one-fourth and the U. S. Department of Agriculture one-half.

WISCONSIN:

The legislature appropriated $750,000 annually for the next six years for the eradication of bovine tuberculosis. Of this amount $300,000 is to be used each year for the testing of cattle by local veterinarians.

WYOMING:

An appropriation of $20,080 was made for sanitary control work, and an indemnity fund of $4,000 for two years was created.

MISCELLANEOUS

DR. HALL PROMOTED

The *Official Record* of the United States Department of Agriculture, under date of October 14, 1925, contained the following announcement:

DR. M. C. HALL

"Dr. Maurice C. Hall, senior zoologist in the zoological division of the Bureau of Animal Industry, has just been appointed chief of that division, succeeding Dr. B. H. Ransom, who died suddenly on September 17.

"Doctor Hall entered the zoological division June 20, 1907. He resigned in 1916 to take a position as parasitologist in the medical research laboratory of Parke, Davis & Co., Detroit, Mich. In 1918 he entered the Army and was commanding officer at Base Veterinary Hospital No. 3. He received his discharge six months later and after a brief time returned to the zoological division.

"Doctor Hall has had teaching experience in a country school, high schools, an academy, and college. He is the author of more than 200 papers and some books dealing with medical and veterinary zoology. He has conducted special investigations in anthelmintic medication and has standardized this subject for veterinary practice in the United States. It was Doctor Hall who proposed the carbon tetrachloride treatment for hookworm disease of man, dogs, foxes, and certain other animals, which is now used in over 1,500,000 cases of human hookworm disease and is regarded as the best-known treatment, being used in practically all countries where hookworm disease occurs. He recently proposed with Dr. J. E. Shillinger another new drug, tetrachlorethylene, which promises to be even better than carbon tetrachloride for hookworm disease.

"Doctor Hall is a foreign member of the Reale Academia d'Agricoltura Torino, fellow of the American Association of Agricultural Sciences, member of the American Society of Tropical Medicine, American Veterinary Medical Association, American Society of Parasitologists (councillor), Entomological Society of America, American Association of Economic Entomologists, Washington Academy of Sciences, Helminthological Society of Washington (secretary 10 years, past president), Entomological Society of Washington, Sigma Xi, and Phi Beta Kappa. He is an honorary member of the Maine Veterinary Medical Association and the North Carolina Veterinary Medical Association."

Congratulations, Dr. Hall.

THE WORK OF THE VETERINARIAN AS IT SHOULD BE

Are our cities, especially the smaller cities and towns, using their veterinarians' professional knowledge to their best advantage? This profession belongs to the same class of public service as that of the human physician.

The graduate veterinarian of today is a man or woman who has completed a 4-or 5-year course of professional study and

training, having previously finished at least a first class high school course or its equivalent. Endowed with these qualifications he is prepared to practice a profession that dates back to the earliest days of our civilization. But the profession has made its greatest strides in the last fifteen years, previous to this time having suffered the same fate as the human physicians of being hampered in its progress by quacks, nongraduate horse-traders and "Hi-Jacks."

The future of the public health of the civilized world lies too greatly in the hands of this profession for the laity to be so ill-acquainted with it. How many know that at least 99 per cent of the serums and antitoxins produced for the use of the M. D.s in the prevention and control of human diseases are taken from animals under the supervision of expert graduate veterinarians? The enforcement of the pure food and drug act is largely in the hands of the graduate veterinarians, and milk, watched so closely by mothers to safeguard babies' health, is scrutinized from the food the cow eats to the bottle that carries it to the mother by graduate veterinarians as food inspectors, dairy inspectors, herd tuberculin testers and expert herdsmen.

But there is another phase of the work the public is overlooking: that of the family consultation of the veterinarian as to the health, habits and feeding and care of household pets and their communicable diseases. Each boy and girl of a community should know personally the local veterinarian by having consulted him about Jack, the dog. They could learn from him of Jack's habits, good and bad, and his ability to harbor parasites and germs dangerous to the dog's human friends, and how these might be controlled. Sister or mother should consult the veterinarian as to the pet cat or the canary. When the cow eats everything she can get hold of, from old shoes to paper, her owners should know it is not a habit, but an abnormal condition that a veterinarian knows how to correct.

Veterinary schools are demanding a better type of student, men with better educational foundations, men who aspire to be all the community may demand of them in their particular field. The present day graduate veterinarian is as far advanced over the "horse doctor" of a few years ago, professionally and socially, as the graduate physician today is over the old mid-wife.

The veterinarian now keeps abreast of the times, bears himself with pride, and takes a leading part in various civic organizations

fighting for sanitary improvements and the public health. But the public has not wholly awakened to the scope and importance of his work, and the public too often fails to appreciate the real merits of his profession.

—*Weekly Kansas City Star.*

CATTLEMEN ADOPT RESOLUTION

The following resolution was adopted at the fourteenth annual convention of the Southern Cattlemen's Association, at Atlanta, Ga., October 12-13-14, 1925.

WHEREAS, The Texas fever tick has caused untold loss to southern cattlemen and is a great barrier to the progress of cattle improvement in the South, and

WHEREAS, The cattle fever tick is a known carrier of foot-and-mouth disease, one of the most infectious and dangerous cattle diseases of the entire world, and

WHEREAS, Many states have, at great expense of labor and money, eradicated the Texas fever tick, only to be reinfected from the interstate movement of infected cattle, therefore, be it,

Resolved, That such laws, regulations and quarantines should be enacted both by state and federal authorities as to effectually prevent the interstate movement of any cattle from any state in which the Texas fever tick still exists, therefore, be it further

Resolved, That a copy of this resolution be forwarded to each governor and state veterinarian of the southern states and to the chief of the Bureau of Animal Industry, Washington, D. C.

HOW MONEY GOT ITS NAME

An ancient capitalist of Lydia, named Gyges, journeyed down to Sardis to collect a debt. Cattle being money, the debtor pointed to a brindle ox and told Gyges to write out a receipt.

Unfortunately, Gyges wasn't a veterinarian, so when the ox died on his hands he said, "That was a bum steer," and introduced a bill in the Lydian legislature providing for a coinage of tokens to represent the value of cattle. For ages the cow was the chief standard of value, the Latin word for money "pecunias," being derived from "pecus," cattle.

In time, gold money of intrinsic value came into use; "ox talents" with the head of an ox on one side, showing how hard it is to get away from custom. Of course, even in this day, a bond may "die" on its owner's hands, but not if he has carefully inquired into its pedigree before purchasing.

(From an advertisement of a bond house.)

First Cannibal: "The chief has hay fever."

Second Cannibal: "Serves him right; we warned him not to eat that grass widow."

ASSOCIATION MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held in the Ellen Speyer Hospital, 350 Lafayette St., New York City, June 4, 1925, President Bruce Blair presiding.

The minutes of the May meeting were read and approved.

Mr. James Speyer gave a short address of welcome. During his remarks, he spoke of the work of the hospital and its object —charity.

Dr. W. Reid Blair, in response to Mr. Speyer's address, spoke of the growth of the institution. He stated that it had been renamed—the Ellen Speyer Hospital—only after the death of Mrs. Speyer, that it might stand as a monument to her memory and her great work for animals.

Dr. E. O. McKim spoke of the rabies situation in Westchester County. He stated that he did not think that the Department of Farms and Markets was fair in not recognizing rabies vaccination, and placed too much stress on the muzzling of dogs.

After some discussion, a committee was appointed to draw up suitable resolutions to be sent to Commissioner Byrne A. Pyrke, for his consideration, in this and future outbreaks of rabies, should they occur.

Dr. Bruce Blair led the entire party through the newly equipped portions of the hospital, and presented some very interesting cases.

A splendid luncheon was served in the office. A vote of thanks was extended Mr. Speyer and Dr. Blair for their hospitality in entertaining the Association. The meeting adjourned.

C. G. ROHRER, *Secretary.*

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION

The thirty-second semi-annual meeting of the Virginia State Veterinary Medical Association was held in the auditorium of the Y. M. C. A., at Charlottesville, July 9-10, 1925. The meeting was called to order by the First Vice-President, Dr. John S.

Nicholas, and the roll-call showed the presence of a large majority of the members and a number of visitors.

The Association was welcomed to Charlottesville by the City Manager, Mr. Bennett, in a very pleasing and hospitable manner, this address being responded to by Dr. George C. Faville, of Hampton, in which he briefly outlined the strides made by the profession and the Association, since its last meeting in this city, just thirty years ago.

The President's very inspiring address, read by the Secretary, stressed the importance of cooperation and loyalty among the members. Dr. H. C. Givens, of Roanoke, presented an interesting paper on "Cities' Milk Supply," which brought forth considerable discussion concerning the veterinarian's part in the handling of milk.

Dr. J. F. Kagey, of South Boston, discussed city and county ordinances for the control of rabies, under the title of "Municipal Control of Rabies." Much interest was shown in this subject by the practitioners and a number of good and bad points of various ordinances were discussed.

Dr. R. E. Brookbank, U. S. inspector-in-charge of tuberculosis eradication in Virginia, discussed some of the phases of the tuberculin test, expecially in respect to accredited-herd work.

An informal address was then given by Dr. J. G. Ferneyhough, state veterinarian of Virginia, on "Legislation Pertaining to the A. V. M. A. and the Virginia State Veterinary Medical Association." He discussed some very important phases of protecting the profession by legislation and also the relation of the A. V. M. A. to the State Association, more especially in its appointment of A. V. M. A. officers to represent the State, such as resident secretary.

The following resolution on the death of Dr. Thomas Fraser was adopted:

WHEREAS, It has been the will of Almighty God to remove by death on March 10, 1925, one of our oldest and most beloved members, Dr. Thomas Fraser, be it

Resolved, By the Virginia State Veterinary Medical Association, that in his death we realize the profession has lost one of its most enthusiastic members; that this Association has lost one of its strongest supporters, and that the individual members have lost one of the most loyal of friends. Be it further

Resolved, That this Association extend to his wife and the members of his family our heartfelt sympathy in their bereavement, and be it further

Resolved, That a copy of these resolutions be spread upon the minutes, a copy be sent to Mrs. Fraser, and a copy to the professional journals.

The above completed the program and there being no further business, the meeting adjourned to the farm of W. C. Blackwell, where Dr. John W. Adams, of the University of Pennsylvania, held a clinic, at which a number of interesting operations were performed and several cases of obscure lameness were diagnosed.

W. H. ELLETT, *Secretary.*

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

The forty-third annual meeting of the Pennsylvania State Veterinary Medical Association was held at Williamsport, Pa., on September 16-17, 1925.

Williamsport is located on the Susquehanna River in the north central part of the State. It is beautifully situated, with hills surrounding it on all sides. It was once probably the most important lumber-manufacturing point in Pennsylvania, being in the heart of a white pine, hemlock, and hardwood section. Many evidences of its old-time glory still exist.

The headquarters of the Association was the Park Hotel, which is a large building with spacious halls and corridors. The rooms are of generous proportions with high ceilings and fine finish. The building is located on a piece of land several acres in extent, with large trees of several varieties surrounding it. This hotel dates back to the old days when the lumber business was thriving. Williamsport is now in the heart of a rich agricultural district and was an ideal place to hold the annual meeting of our Association.

The meeting was called to order by the President, Dr. F. N. Sherrick, of Connellsville. After the reading of the minutes of the previous meeting, the President addressed the meeting in a very optimistic vein, which was well received by all present. The Secretary and Treasurer then made their reports. Following these came the reports of the various committees which were as follows:

Dr. C. J. Marshall, chairman of the Committee on Medicine and Surgery, gave a very interesting history of the development of the control of diseases in Pennsylvania.

Dr. E. S. Deubler, chairman of the Committee on Hygiene, emphasized the importance of hygienic measures in the control of infectious diseases. He showed how white scours in calves can be controlled by this measure alone.

Dr. G. A. Dick, chairman of the Committee on the Horse Association of America, reported that more interest has been shown in the production of horses in Pennsylvania during the past year than for some time.

Dr. T. E. Munce, chairman of the Committee on Allied Agricultural Associations, announced the arrangements made for the semi-annual meeting in conjunction with the agricultural associations at Harrisburg, in January, 1926.

At this time the secretaries, or authorized representatives, of the thirteen veterinary clubs in Pennsylvania were called upon to report on the activities of their respectvie organizations. The reports were all favorable and indicated that the clubs are all in a thriving condition, destined to play an important part in the life of the profession.

The first paper of the day was presented by Dr. John W. Adams, professor of surgery at the University of Pennsylvania School of Veterinary Medicine, and president of the A. V. M. A. His subject was: "Some Reflections upon the Causes and Surgical Treatment of Hemiplegia Laryngis of Equines." Dr. Adams believes there is some connection between grunting and roaring. Some grunters become roarers, but on the other hand, grunters sometimes never do give symptoms of roaring. The most successful treatment for this disease is the operation brought to light by Professor Williams. It is not always successful, owing to some accident in the healing process over which the operator has no control. The failures run from ten per cent to twenty per cent, in spite of good care.

The first speaker on the program in the afternoon was Dr. F. R. Beaudette, poultry pathologist, New Jersey Experiment Station, New Brunswick, N. J. Dr. Beaudette reviewed many of the diseases to which poultry are susceptible, beginning with the embryo in the shell. He brought out many interesting facts which can be used to advantage by veterinarians in their poultry practice. He stressed the importance of parasitic diseases as the predisposing cause of infectious diseases and gave the treatment used in controlling parasites.

Dr. M. F. Barnes, of the Pennsylvania Bureau of Animal Industry, presented a paper entitled, "Blood Tests in the Diagnosis of Bang Bacillus Disease." How the blood test can be used to eradicate infectious abortion was brought out in this paper. Many other valuable suggestions were also offered in the control of this disease.

Dr. Barnes' paper was followed by the election of officers, which resulted as follows: President, Dr. F. U. Fernsler; 1st vice-president, Dr. W. C. Springer; 2nd vice-president, Dr. E. P. Althouse; 3rd vice-president, Dr. Sherman Ames; recording secretary, Dr. George A. Dick; corresponding secretary, Dr. H. R. Church; treasurer, Dr. D. R. Kohler; trustees, Drs. F. N. Sherrick, P. E. Quinn, R. W. Keepers, H. J. Little, S. G. Hendren.

The second day of the meeting was opened with an address by Dr. J. H. McNeil, president of the United States Live Stock Sanitary Association, and chief of the New Jersey Bureau of Animal Industry, Trenton, N. J. Dr. McNeil gave a very interesting address on tuberculosis eradication in New Jersey. In his address he explained how the work was presented to the farmer, giving figures to show that it is to his advantage to free his herd from tuberculosis.

Dr. Raymond R. Birch, of the Cornell University Experiment Station, Ithaca, N. Y., addressed the meeting on "Some Facts Regarding So-Called Mixed Infection in Swine." This was one of the most interesting addresses of the meeting. Many hazy points were cleared up and a clear outline of procedure in outbreaks of swine diseases presented.

Dr. T. A. Sigler, of Greencastle, Indiana, A. V. M. A. Representative on the Board of Managers of the Horse Association of America, was the next speaker of the day. His subject was: "Modern-Day Horse Problems." Dr. Sigler gave a splendid review of the horse industry and presented data showing many encouraging signs of renewed interest in the horse-breeding industry.

Drs. C. J. Marshall and W. J. Lee, of the University of Pennsylvania School of Veterinary Medicine, presented a paper on "Equine Influenza." They reported the results obtained from the use of hemorrhagic septicemia aggressin and anti-hemorrhagic septicemia serum in controlling equine influenza under practical, sales-stable conditions. The results were on the whole favorable, but the authors feel that many more cases must be treated before the value of this treatment can be definitely ascertained.

Dr. H. W. Turner, of the Pennsylvania Bureau of Animal Industry, was the last speaker on the program. His subject was: "Other Opportunities and Responsibilities for the Veterinarian." He called attention to opportunities of the veterinarian in handling diseases of sheep and swine. Dr. Turner stressed the fact that

veterinarians can help the farmer a great deal by advising him in the control of parasitic diseases of these animals and in their care and management, especially at farrowing and lambing time.

The meeting was then adjourned.

G. A. DICK, *Recording Secretary.*

EASTERN IOWA VETERINARY ASSOCIATION

The twelfth annual meeting of the Eastern Iowa Veterinary Association convened at the Montrose Hotel, Cedar Rapids, Iowa., October 7-8, 1925. The attendance was larger by one-third than any previous meeting in the history of the Association.

The meeting was called to order by President J. C. McCabe, of West Liberty. Mayor J. F. Rall welcomed the veterinarians to Cedar Rapids and invited the veterinarians to make free use of the city golf links and parks. Dr. J. B. Bryant, of Mt. Vernon, replied to the address of welcome and expressed very high praise for the certified milk ordinance of Cedar Rapids. Dr. Bryant stated that a similar ordinance had been adopted by a great many other cities following the lead of Cedar Rapids.

The afternoon session opened with an informal talk by Mr. Verne Marshall, editor of the Cedar Rapids *Evening Gazette*. Mr. Marshall delivered his remarks straight from the shoulder and among other things he suggested that the members of the veterinary profession should get together in their views concerning certain animal diseases, particularly rabies and hog cholera. "The newspapers want to publish the truth; they want to help you in your efforts to promote the best interest of the Iowa farmer," said Mr. Marshall. "They are at a loss when they do not know which side to believe every time there is a controversy among you veterinarians."

Dr. E. M. Nighbert, of Queen City, Mo., gave an address on the subject of "Stomach Worms of Sheep and Their Control." This subject was very well received, particularly by those practitioners who had not had an opportunity to become very familiar with this particular condition. Dr. A. T. Kinsley, of Kansas City, Mo., talked on "Hog Diseases." In view of the fact that swine practice constitutes 65 per cent or more of the work of the average veterinarian in the Corn Belt, Dr. Kinsley's contribution was received with a great deal of interest.

Hon. Mark G. Thornburg, Secretary of Agriculture, spoke on "The Local Practitioner in County Area Work." Dr. Peter Malcolm, state veterinarian, Dr. J. A. Barger, of the Bureau of

Veterinarians and families in attendance at the twelfth annual meeting of the Eastern Iowa Veterinary Association, Cedar Rapids, Iowa, October 7-8, 1925.

Animal Industry, and Dr. W. C. Stewart, of Vinton, in charge of Benton County, all spoke on the subject of tuberculosis eradication from their different standpoints.

Wednesday evening was devoted to a social program, including a banquet. Dr. A. T. Kinsley acted as toastmaster. An innovation in connection with the banquet was a burlesque, staged by Mr. A. O. Ambrose, of Cedar Rapids, entitled, "Why I Obtained a Permit to Vaccinate My Own Hogs." Mr. Ambrose, dressed as a typical hay-seed, discussed the two-day school and his experiences after "graduating." Mr. Ambrose kept the large audience of veterinarians and their ladies in a continuous uproar of laughter throughout the number. Dr. Nighbert gave his famous rendition of a southern coon hunt. This also brought down the house. Scotch songs by Mrs. A. R. Menary closed a very enjoyable program.

"Rabies from a Legislative Standpoint" was presented by Dr. John Patterson, of Hedrick. Dr. J. C. Moran presented a paper on rabies and dealt with the human side of this disease. A lively discussion followed and it is believed that Iowa will have some legislation relative to rabies in the very near future. The discussion was ably lead by Dr. Frank Breed, of Kansas City, Mo., who explained many technical points in connection with the disease. A question box was very ably conducted by Dr. Kinsley and proved to be one of the most interesting features of the meeting.

A clinic was held the afternoon of the second day in the hospital of Dr. J. W. Griffith. The clinic was divided into four sections: hogs, poultry, small animals, and large animals. Dr. W. F. Guard, of Ames, conducted the hog clinic. Dr. D. K. Eastman, of Cedar Rapids, was in charge of the small animal work. Dr. F. J. Crow, of Iowa City, and Dr. J. H. Schrader, of Oxford, managed the poultry clinic. Dr. J. C. Glenn, of Norway, had charge of the large animals.

One of the most interesting reports was that of the Publicity Committee, which has been very active the past year. A large display, consisting of clippings taken from newspapers during the past year, commanded a great deal of attention and favorable comment.

Officers for the ensuing year were elected as follows: President, Dr. J. C. Glenn, of Norway; vice-president, Dr. J. H. Schrader, of Oxford; secretary, Dr. J. B. Bryant, of Mt. Vernon; Executive Board, Drs. J. R. Potter, of Iowa City, W. H. Wilson, of Mechanicsville, and J. C. McCabe, of West Liberty.

MAINE VETERINARY MEDICAL ASSOCIATION

The fall meeting of the Maine Veterinary Medical Association was called to order at 8 p. m., October 14, 1925, at the Dewitt Hotel, Lewiston, by President E. E. Russell. There were eleven members and one visitor in attendance. The minutes of the last meeting were read and approved, and the regular business was disposed of.

Dr. H. W. Jakeman, of Boston, spoke of the advantage of having the New England veterinarians form a New England Association, with the object in view of having one large meeting each year at which leaders in the veterinary field would deliver instructive lectures. It was then moved and seconded that the sense of the meeting was in favor of such a New England Veterinary Association being formed.

Dr. A. J. Neal, of Bangor, reported that the State Attorney General was in favor of enforcing the State law that requires all non-graduates to have passed an examination given by the State Board of Veterinary Examiners before they can practice in the state of Maine. Dr. P. R. Baird, of Waterville, reported a case where two laymen were brought before the county attorney for practicing veterinary medicine illegally, and both were put out of business and paid fines in addition. Dr. M. E. Maddocks agreed to go with Dr. P. R. Baird to investigate the case of a quack who was reported practicing contrary to law.

Drs. Murch, Sally and Sherman Cleaves were placed on the honorary membership roll.

Dr. L. E. Maddocks brought before the meeting a pamphlet sent through the U. S. mails to cattle owners, by the Graham Scientific Breeding School, of Kansas City, Mo. This pamphlet guarantees to teach the average breeder or herdsman how to make barren cows breed, prevent contagious abortion, etc. The pamphlet discredits veterinarians and alleges that the U. S. Government recognizes this school. The pamphlet is being forwarded in original envelope, by Dr. J. B. Reidy, to the U. S. Bureau of Animal Industry, at Washington, D. C., for investigation.

Dr. H. W. Jakeman gave a very practical talk on contagious abortion. He advised the practitioner to keep an open mind in spite of the variance in opinion on this subject among veterinary leaders. He recommends the use of the agglutination test as a herd test only—to prove whether abortion was in the herd, and

stated that the weight of evidence was against the use of killed organisms in the treatment of this trouble, quoting Dr. Theobald Smith, Dr. E. C. Schroeder and others, who support vaccination with living germs for contagious abortion treatment. Microscopic examination of the semen of the bull, vaccination of every cow that freshens, as well as additions to the herd, together with use of metritis bacterin, were advisable also, Dr. Jakeman said, in abortion cases.

Dr. M. E. Maddocks took issue with Dr. Jakeman, as also did Dr. P. R. Baird, both of whom have had marked success with the use of bacterins in abortion. Dr. G. R. Inglis reported that the vaccine treatment was successful in abortion for him, whereas bacterins were failures. Dr. M. E. Maddocks reported one case where abortion was traced to an infected well and two cases where the wife of the farmer had an abortion at the time abortion was in the farmer's herd, this tending to substantiate the theory that milk might have been the carrier to the woman from the cattle.

Dr. Baird spoke of having been called to a case of abortion in a herd that had previously been treated by another very capable brother veterinarian, but apparently previous treatment was unsuccessful, because of bad sanitary conditions. In this case, Dr. Baird first corrected the bad sanitary conditions, which included tearing down a shed that kept sunlight out of the stable and, after that, treated the herd, instructing the owner regarding how to keep the herd clean afterwards. Dr. Baird says that he gives equal credit to the care and sanitation as to the drugs used.

Dr. M. E. Maddocks reported bringing an apparently dying cow back to life by use of the stomach-tube, stimulants and inflation of the udder. The cow had been down twenty-four hours and had calved several months before.

Dr. Inglis reported a case where seventeen of twenty-three cattle, which had been in an orchard, were found in a comatose condition. He first inflated the udders and after they regained control of their muscles he used a physic, saving the animals.

Dr. Baird reported a case of arsenate of lead poisoning that he treated with iron oxid and magnesium sulphate, together with stimulants.

Dr. Davis reported a case where the farmer fed a handful of arsenate of lead to each of his cattle by mistake. When he was called twenty-four hours afterwards, two animals were suffering so much and apparently beyond hope of saving, that the doctor shot them to put them out of their misery. He saved thirteen of

the fourteen head, treated by big doses of castor oil with stimulants, together with an antidote. The peculiar part of this case was that the farmer "cussed out" the doctor later for having shot the two animals and did not give him credit for saving the others or even pay him for his services.

Dr. W. H. Corey reported a case of lead poisoning also. Dr. M. E. Maddocks reported a case of calves suffering from lead poisoning, due to licking painted boards of their pens.

Dr. L. E. Maddocks reported a case of sheep poisoning by nitrate of soda with postmortem lesions similar to septicemia hemorrhagica. Dr. Jakeman reported a case with similar lesions, in the West, due to a poisonous weed.

Dr. Neal reported a case of "flu" in cattle, near Bangor, and Dr. Jakeman suggested a couple of treatments witn *B. bovi-septicus* and streptococcus bacterins, a day apart, as curative, and as preventive treatment, four or five days apart.

J. B. Reidy, *Res. Sec. for Maine.*

ONTARIO VETERINARY ASSOCIATION

The fifty-first annual meeting of the Ontario Veterinary Association was held at the Ontario Veterinary College, Guelph, October 14-15, 1925. The convention was well attended and the members present expressed themselves as being highly pleased with the program. Representatives of the profession from bordering states were also present.

The executive of the Association had previously determined that this meeting should be of a character that would benefit the practicing veterinarian and the supervision of it was placed in the hands of Dr. R. A. McIntosh, of Guelph.

The morning of October 14th was devoted chiefly to matters of business in connection with the Association. In the afternoon, the first period was devoted to a demonstration of obtaining blood from hens, and a simple method of setting up these samples for the agglutination test for bacillary white diarrhea in fowls. This demonstration was conducted by Dr. Ronald Gwatkin, of the Ontario Veterinary College, who also gave an instructional lecture during the procedure. On the following morning the interpretation of the test was completed.

The next item of the program was an instructional discourse and demonstration of the examination of feces for parasitic eggs, and scrapings from mange-infested animals, by the use of a

microscope, for the diagnosis of parasitism. Drs. Schofield and Batt, of the College, conducted this part of the afternoon session. Discussions of the clinical aspects of these conditions were given by Drs. Campbell and Lavery, of Toronto, and Dr. F. E. McClelland, of Buffalo, N. Y.

The evening session was devoted to addresses and the election of the executive, the chief speaker being Dr. C. D. McGilvray, principal of the Ontario Veterinary College. After welcoming the members of the Association to the institution, Dr. McGilvray gave a very interesting and comprehensive outline of the history of veterinary colleges on this continent, both in Canada and the United States, from their inception up to the present time. He also spoke of the status of the profession during this time, referring to the character of the graduate as the colleges passed from privately-owned institutions to state-controlled institutions. The latter demanded much higher entrance requirements of the student and this would ultimately add much to the prestige of the profession. Reference was made to the changes that had occurred in the activities and usefulness of the veterinarian, both in practice and in civil service, and also of the accomplishments of the profession, particularly in Canada, where live stock was singularly free from the ravages of the so-called animal plagues.

Following this address, the executive of the ensuing year were elected. President, Dr. J. Brown, of Burford; 1st vice-president, Dr. R. W. Devereaux, of Brantford; 2nd vice-president, Dr. R. A. McIntosh, of Guelph; secretary-treasurer and registrar, Dr. H. W. Le Gard, of Weston; executive committee, Drs. J. S. Glover, J. A. Campbell, J. S. Mumford, R. F. Lavery, all of Toronto. Ex-officio member, Dr. C. D. McGilvray, of Guelph.

During the election, Dr. Joseph Hawkins, of Detroit, a native of Guelph and the only living charter member of the Association, gave a short address. Dr. R. G. Law, of Kirkfield, who is associated with a new fox-breeding experiment farm, established by the Ontario government, at Balsam Lake, gave a general talk on the black fox industry. Dr. G. R. Booth gave a paper on "Coccidiosis in Cattle," having recently experienced an outbreak of that disease in the vicinity of Palmerston, Ontario.

At the conclusion of the addresses, the students of the College entertained the visiting veterinarians with a social hour, in which a light lunch was served.

On the morning of the second day, papers were presented by Dr. D. R. Caley, of Fisherville, and Dr. H. B. Atkinson, of

Embro, on "Infectious Mammitis," and "Navel-Ill in Foals," respectively. Considerable discussion took place in reference to these topics. The rest of the day was devoted wholly to clinics, chiefly surgical in character, and consisted of the following items:

"Clinical Diagnostics in Small Animals," by Dr. J. A. Campbell.
"Entropion Operation in a Dog," by Dr. F. E. McClelland.
"Demonstration of Handling and Dosing Foxes," by Dr. R. G. Law.
"Teat Operations in Cows," by Dr. F. R. Page.
"Sterility Diagnosis," by Dr. H. M. Le Gard.
"Fistula Operation," by Dr. D. R. Caley.
"Hernia Operation," by Dr. R. A. McIntosh.

Several other practical demonstrations were well conducted by other members of the Association. At the conclusion of the meeting a vote of thanks was tendered those who were responsible for the program.

R. A. McIntosh, *Res. Sec. for Ontario.*

INTERSTATE VETERINARY ASSOCIATION

The meeting of the Interstate Veterinary Association was held in the Chamber of Commerce Club Rooms, Sioux City, Iowa, October 30, 1925.

The program was considered one of the best ever presented at a meeting of this Association. Dr. H. E. Bemis, professor of surgery at the Iowa State College, gave some very practical surgical case reports, illustrated with stereopticon views. He described local anesthesia, including nerve-blocking, for oral surgery and dentistry; fistula of the withers, and his changed method of operating on these cases. He also gave some interesting points on surgery of the foot of the horse. In his general remarks on the subject, Dr. Bemis stated that he had no excuses to offer for presenting a discussion of veterinary surgery, because it was one of the phases of general practice in which the trained man could, in a real way, prove his ability.

Dr. Sivert Eriksen, pathologist of the Missouri State Poultry Experiment Station, Mountain Grove, Mo., presented "Problems of the Poultry Practitioner," and conducted a brief but very interesting clinic on diseased birds. Dr. Eriksen received considerable praise for his familiarity with the subject, together with his ability and willingness to instruct his listeners. His paper will be published in an early issue of the Journal.

"Observations on a Few Points in Practice," by Dr. J. A. Given, of Marcus, Iowa, demonstrated that Dr. Given had really made some worth-while observations. Dr. B. F. Ward, of Glen-

wood, Iowa, a practitioner for over thirty years, read a paper on "Treatment of Injuries." Younger veterinarians considered some of the treatments quite radical, but Dr. Ward's experience gave him considerable advantage in the discussions. Dr. L. U. Shipley's "Case Report" proved to be a warning to veterinarians, engaged in immunizing swine, to be sure that a supposedly healthy herd is not already infected. By so doing, the practitioner will not place himself, in the eyes of the laity, in the same class as the farmer vaccinator.

The ladies attending the meeting completed their organization of an auxiliary. Mrs. A. Howard was chosen president, Mrs. J. M. Lichty, vice-president, and Mrs. F. C. Bornschein, secretary-treasurer. A theatre party provided entertainment for the auxiliary members in the afternoon. Both organizations enjoyed a banquet in the evening at the West Hotel, provided by the Sioux City, Purity and Sioux Falls Serum companies.

Officers for the ensuing year were elected as follows: Dr. E. W. Sadler, of Wagner, So. Dak., president; Dr. G. B. Winch, of George, Iowa, vice-president; Dr. P. L. Ellis, of Merrill, Iowa, (re-elected) secretary-treasurer.

P. L. Ellis, *Secretary.*

CONESTOGA VETERINARY CLUB

The regular monthly meeting of the Conestoga Veterinary Club was held in the Medical Rooms of the Stevens House, Lancaster, Pa., Nov. 12, 1925.

Dr. W. J. Lentz, professor of anatomy and in charge of the small animal clinic in the University of Pennsylvania Veterinary School, delivered an instructive lecture on "Diseases of Small Animals." Dr. Lentz' lecture was the third of the present series being given by the University of Pennsylvania Veterinary Extension School and was greatly appreciated by those present.

Dr. Harry W. Barnard presided at the meeing.

Henry S. Weber, *Secretary.*

INTERESTING EXHIBIT

The cooperative work being done on predatory-animal eradication by the various wool growers' associations, the State Board of Live Stock Inspection Commissioners, and the Biological Survey was featured in an exhibit as part of the main display of the Federal Department of Agriculture, at the Colorado State Fair, held at Pueblo, during the week of September 1.

NECROLOGY

HENRY JACKSON WATERS

Dr. Henry Jackson Waters, managing editor of the *Weekly Kansas City Star*, died October 26, 1925, after a brief illness.

Although not a member of the profession, Dr. Waters was one of the strongest champions veterinarians ever had. His many years of close association with the live stock industry had brought him in contact with a number of prominent members of the veterinary profession and no one more fully appreciated the value of competent veterinary services than did Dr. Waters. On frequent occasions he wielded his editorial pen in paying a tribute to the accomplishments of the profession, and there was no one to whom veterinarians could go for assistance, with greater assurance of support, than Dr. Waters.

Born on a Missouri farm, in 1865, as a boy Dr. Waters broke mules for his father and did other chores about the farm that gave him first-hand knowledge that was later invaluable to him in his life work. He attended and was graduated from the University of Missouri, after which be became, successively, assistant secretary to the State Board of Agriculture, an official at the Missouri Agricultural Experiment Station, professor of agriculture at the Pennsylvania State College, instructor in animal nutrition in the Graduate School of the Ohio State University, dean of agriculture at the University of Missouri, instructor in animal nutrition at the University of Illinois, president of the Missouri State Board of Agriculture, and president of the Kansas State Agricultural College. In 1917 he resigned the latter position to assume the editorship of the *Weekly Kansas City Star*. During the war Dr. Waters was Federal Food Administrator under Herbert Hoover.

Among the veterinarians with whom Dr. Waters came in contact, during his various college connections, were the late Dr. Leonard Pearson, of the University of Pennsylvania; Dr. J. W. Connaway, of the University of Missouri; and Dr. R. R. Dykstra, of the Kansas State Agricultural College. It was while Dr. Waters was at the Pennsylvania State College that he met Dr. Pearson, and among the very first tuberculin tests of cattle to be made in the United States was a test arranged by

Dr. Waters and Dr. Pearson, on the herd of the Pennsylvania State College.

Dr. Dykstra is authority for another incident which shows the deep interest that Dr. Waters had for the veterinary profession. It happened during the time when veterinarians were seeking increased recognition as army officers. Certain members of the House Committee on Military Affairs were opposed to raising the rank of veterinarians. Some of the strongest opposition, it was reported, came from a Kansas member. Friends of the bill, located in Washington, asked Dr. Dykstra to see what he could do with the Kansas member who was opposed to it. Very little headway could be made with the Kansas member until the matter was laid before Dr. Waters. In his characteristic manner Dr. Waters quickly replied, "The veterinary profession is deserving of this recognition. I know the Kansas member opposed to this legislation very well, and although he is of different political faith from myself, I will take the matter up with him and do everything I can to change his attitude." Dr. Waters wrote to Dr. Dykstra, at the time, that he had taken up the matter with the Kansas member and that he believed that everything would work out all right. As we all know, the profession did finally receive the increase in rank and no small share of credit should go to Dr. Waters for the interest he took in the profession's behalf on this occasion.

It is by meriting and winning the appreciation and support of such men outside of the veterinary profession, as exemplified by Dr. Waters, that we can expect to win and hold a place for the veterinary profession in the eyes of the public. One word from the tongue or pen of a man like Dr. Waters will go further than many pages of self-advertisement originating within the profession.

ROBERT F. BLATCHFORD

Dr. Robert Francis Blatchford died at the home of his parents, Dr. and Mrs. F. M. Blatchford, Brighton, Mich., October 25, 1925.

Born in Brighton, Mich., August 1, 1896, Dr. Blatchford was graduated from the local high school in 1916 and entered Michigan State College the same year. He was one of the first Brighton boys to enlist in the late war (Aug. 3, 1917) and saw two years of service, including fifteen months of overseas service. He was

discharged May 16, 1919, returned to college the following fall and completed his veterinary course in 1922.

Dr. Blatchford entered the employ of the State Department of Agriculture and was stationed in Detroit and later in the Upper Peninsula. While there his health broke down and he was compelled to give up his work. He was a fine type of young man, extremely conscientious in his work, possessed of the very highest ideals and with a promising future before him.

Dr. Blatchford joined the A. V. M. A. in 1923. He was a member of the Michigan State Veterinary Medical Association, Brighton Lodge F. and A. M., Delphic and Alpha Psi fraternities, and the American Legion. He leaves his parents, his widow and one brother.

H. C. McCARTNEY

Dr. H. C. McCartney died at his home in Ellenville, N. Y., of penumonia, September 4, 1925. He was a graduate of the New York State Veterinary College at Cornell University, class of 1914, and was associated in practice with his brother, Dr. Robert McCartney (Corn. '18).

MILTON C. McCLAIN

Dr. M. C. McClain, of Jeromesville, Ohio, died October 9, 1925, at the age of 69 years. He was a graduate of the Ontario Veterinary College, class of 1886, and had practiced for almost forty years in Ashland and surrounding counties. He was a member of the Ohio State Veterinary Medical Association.

CHARLES SAUNDERS

Dr. Charles Saunders, of Eldorado, Kans., died on November 5, 1925, at the age of seventy-eight years. Dr. Saunders was one of the earliest matriculants at the Kansas City Veterinary College, having been graduated in the class of 1893. He joined the A. V. M. A. in 1895.

In reporting the death of Dr. Saunders, Dr. A. H. Gish, of Eldorado, commented as follows: "Dr. Saunders was always a staunch supporter of the profession, and always consistently upheld the honor and dignity of the profession. He was one of the oldest practitioners in the State, both in age and length of service. He was always a fair competitor and his passing from the stage of action is very much regretted."

BENJAMIN DWIGHT PIERCE

Dr. Benjamin D. Pierce, of Springfield, Mass., died suddenly at his home, November 4, 1925, after an illness of one week. Although Dr. Pierce had not been in the best of health for some time, the end was wholly unexpected. He had been able to attend to his official duties, as state veterinarian for the district of western Massachusetts, up until a few days before his death.

Born in Worcester, Mass., March 19, 1859, Dr. Pierce could trace his lineage back to the colonial days. On his mother's side he was a direct descendant of John Mack, who emigrated

DR. BENJAMIN D. PIERCE

to this country in 1669, from Inverness, Scotland. He moved to Springfield in 1865, and maintained a residence there practically continuously until his death.

Dr. Pierce joined the A. V. M. A. at the meeting in Boston in 1883. The occasion of completing forty years of continuous membership was noted editorially in the JOURNAL, just prior to the meeting in Montreal in 1923. This was the last meeting of the A. V. M. A. attended by Dr. Pierce, as his physician advised him against attending the meeting in Des Moines on account of the warm weather, and against attending the meeting in Portland

on account of the long distance to be traveled. The editorial referred to contained considerable biographical data concerning Dr. Pierce and was concluded with the following sentence: "It is much more pleasant to say a good word for a deserving member, while he is here to enjoy it, than to say it with flowers." Dr. Pierce served as resident secretary of the A. V. M. A. for Massachusetts from 1898 to 1905 and from 1906 to 1910. He was a member of the Committee on Necrology, 1923-25.

In addition to his membership in the A. V. M. A., Dr. Pierce was a charter member of the Massachusetts Veterinary Association, a member of the New York State Veterinary Society and the Connecticut State Veterinary Medical Association, a member of the George Washington Chapter of the Sons of the American Revolution and the Connecticut Valley Historical Society. Dr. Pierce was a 32nd degree Mason and a Shriner. He is survived by his widow, and one son, Dr. J. Dwight Pierce, of Natick, Mass., assistant state veterinarian.

EDWIN HOGG

Dr. Edwin Hogg, of Wilkes-Barre, Pa., died October 28, 1925. He was a graduate of the University of Pennsylvania, class of 1895, and had practiced in Wilkes-Barre continously for the past thirty years. His practice included a great deal of work with mules used in the coal mines around Wilkes-Barre. During the past few years, his nephew, Dr. Ernest W. Hogg (U. P. '14), had been associated with him.

Dr. Hogg joined the A. V. M. A. in 1895. He was a member of the Pennsylvania State Veterinary Medical Association, and served as vice-president, 1907-08.

A. E. CUNNINGHAM

Dr. A. E. Cunningham, of Cleveland, Ohio, died November 15, 1925, after a brief illness. He was 57 years of age. Dr. Cunningham was a graduate of the University of Pennsylvania, class of 1898. He immediately located in Cleveland and established a lucrative practice there. He joined the A. V. M. A. in 1900.

In commenting on Dr. Cunningham's death, Dr. A. S. Cooley wrote as follows: "This death removes another veteran practitioner from our midst. He was a manly man, a good friend. All liked him. It was interesting to talk with him on professional

matters. He was successful in his profession. He had provided a good home for his family. My extended and happy acquaintance with Dr. Cunningham brings to mind many pleasant and never-to-be-forgotten incidents that will be preserved in the storehouse of grateful recollection. What a pleasure throughout life to have these recollections stored away with reference to manly men of high character!"

Dr. Cunningham is survived by his widow and one son.

MRS. O. J. KRON

Our heartfelt sympathy goes out to Dr. O. J. Kron, of San Francisco, Calif., in the death of his wife, October 15, 1925, after an illness of one week

MARRIAGES

Dr. D. C. Bassett (Corn. '25), of Hempstead, N. Y., to Miss Emma Winifred Gallaway, of Hempstead, September 19, 1925.

Dr. J. B. Fuller (Corn. '21), of Springville, N. Y., to Miss Leda Thala Ball, of Binghamton, N. Y., September 19, 1925, at Binghamton.

Dr. B. Scott Fritz (U. P. '17), of Lancaster, Pa., to Miss Mary Eleanor Quigley, of Coatesville, Pa., October 17, 1925.

Dr. James S. Hogg (U. P. '24), of Oxford, Pa., to Miss Mary Emily Windle, of Faggs Manor, Pa.

Dr. Frederick W. Rutherford (Ont. '10), of Maysville, Mo., to Miss Georgia J. Campbell, of St. Joseph, Mo., October 19, 1925, at St. Joseph, Mo.

BIRTHS

To Dr. and Mrs. W. I. Nelson, of Arlington, Nebr., a daughter, Marilyn Marie, September 24, 1925.

To Dr. and Mrs. L. I. Hines, of Spencer, Nebr., a daughter, September 26, 1925.

To Dr. and Mrs. A. F. Berger, of Alta, Iowa, a son, August F., September 22, 1925.

To Dr. and Mrs. H. L. Bennet, of O'Neill, Nebr., a daughter, September 7, 1925.

To Dr. and Mrs. E. C. Deubler, of Ithan, Pa., a son, October 3, 1925.

PERSONALS

Dr. C. C. Rife (Corn. '25) is associated with Dr. Wright, of Atlanta, Ga.

Dr. F. E. Stiles (McK. '09), Battle Creek, Mich., is building a new home.

Dr. Olene Jacobson (Iowa '25), formerly of Jewell, is now located at Burt Iowa.

Dr. J. H. Yarborough (Iowa '23), of Denmark, S. C., has removed to Miami, Fla.

Dr. Philip Ritter (K. C. V. C. '08), of Kansas City, Mo., has removed to Gashland, Mo.

Dr. E. L. Montfort (Corn. '20) has removed from Richford Springs to Morrisville, N. Y.

Dr. J. B. Kingery (Ind. '06), of Logansport, Ind., has sold his practice to Dr. S. F. Gaynor.

Dr. W. E. Norden (K. C. V. C. '08) has removed from Avoca, Iowa, to Stromsburg, Nebr.

Dr. R. A. Moye (Iowa '17), formerly of Manson, Iowa, in now located at Manchester, same state.

Dr. F. C. Wilson (Colo. '23), who has been located at Leesburg, Fla., has removed to De Land, Fla.

Dr. R. O. Wilson (K. C. A. C. '15) has requested a change of address from Dunseith to Bottineau, N. D.

Dr. R. R. Morris (T. H. '14), of Martin, Tenn., has been appointed assistant state veterinarian of Tennessee.

Dr. Frank Boggess, of Roodhouse, Ill., has taken over the practice of Dr. H. H. Seeley, of White Hall, Ill.

Dr. A. L. Tiffany (Ont. '05), of Monroe, Mich., displays the title "realtor" in connection with that of veterinarian.

Dr. L. R. Pratt (Colo. '23) has removed from Aurora, Colorado, to Denver. His new address is 44 South Emerson St.

Dr. R. M. Monroe (Corn. '22) condusts a retail lumber business in connection with his practice at Bainbridge, N. Y.

Dr. William B. Kohn (U. P. '18) is attending the Graduate School of Medicine of the University of Pennsylvania.

Dr. R. A. Lantz (K. C. V. C. '13), who recently located at Denison, Iowa, has moved again, this time to Woodbine, Iowa.

Dr. F. C. Sims (K. C. V. C. '10) is back at Aurora, Nebr., after having been located in Grant, Nebr., for several years.

Dr. A. Swanson (Chi. '13), who has been in practice at New Hall, Iowa, for the past ten years, has moved to Atkinson, Iowa.

Dr. Benj. P. Chodos (U. P. '10), who has been in practice at Gap, Pa., for a number of years, has removed to Lancaster, Pa.

Dr. Arthur H. Burling (U. P. '04) recently purchased a home at Brookline, Pa., where he intends to take up the practice of veterinary medicine.

Dr. John T. McGrann (U. P. '21) opened his new veterinary hospital at 697 Pennington Ave., Trenton, N. J., about the middle of November.

Dr. E. S. Deubler (U. P. '05), of Narberth, Pa., attended the recent National Dairy Show and Lake States Tuberculosis Eradication Conference, at Indianapolis.

Dr. Roy B. Whitesell (Ind. '10), of Lafayette, Ind., was severely injured recently, when his automobile was hit by a train on the Wabash crossing near his home.

Dr. C. R. Roberts (Corn. '22) has left Morrisville, N. Y., and is now located at Norwich, N. Y., which is headquarters for his inspection work with the Sheffield Farms, Inc.

Dr. H. L. Morency (Colo. '25), of Boulder, Colo., has accepted a position at Michigan State College, as a member of the staff of the Department of Physiology and Pharmacology.

Dr. John W. Vansant (U. P. '03), of Fox Chase, Pa., recently returned from a two-weeks hunting trip in Maine. He succeeded in bagging a deer and a bear, which is considered "quite good."

Dr. D. A. Yandell (K. S. A. C. '23), formerly located at St. Francis, Kans., has accepted a position with the American Society for the Prevention of Cruelty to Animals, in New York City.

Dr. D. M. Warren (O. S. U. '24), who practiced in Urbana, Ohio, during the past year, has accepted a part-time assistantship in the Department of Veterinary Science at the University of Wisconsin.

Dr. R. C. Julien (McK. '07), state veterinarian of Indiana, addressed the seventh annual meeting of the Indiana State Poultry Association, at Purdue University, Oct. 6-7-8, on the subject of poultry diseases.

Dr. John H. Winstanley (U. P. '10), of Philadelphia, Pa., took his customary fall piscatorial excursion about the middle of October and incidentally lost a large portion of his reputation as a disciple of Izaak Walton.

Dr. S. E. Bruner (U. P. '06), of the Pennsylvania Bureau of Animal Industry, addressed the eighteenth annual convention of the International Association of Milk Dealers, at Indianapolis, Ind., Oct. 12-13-14, 1925, on the subject, "Present Status and Future Outlook of the Tuberculin Test."

Dr. O. A. Taylor (Mich. '15), assistant professor of physiology and pharmacology, Division of Veterinary Science, Michigan State College, has been granted a leave of absence, effective November 1, 1925. Dr. Taylor has entered private practice in Detroit, Mich., being associated with Dr. Robert Armstrong.

Dr. W. A. Hagan (K. S. A. C. '16) of Cornell University, has been in Europe since the latter part of August. He traveled from Copenhagen to Berlin by Airplane, and expected to spend ten weeks in a course of lectures on immunity at the Robert Koch Institute, returning to Ithaca in time for the opening of the second semester.

Dr. T. E. LeClaire (Laval '90), of Calgary, Alta., is leaving soon for the South, where he expects to spend the winter, returning to Calgary about next June or July. Last winter Dr. LeClaire made a very nice and instructive voyage by sailing from New York to Rio de Janeiro, then to Uruguay and Buenos Aires (Argentina), then by rail across the Andes to Valparaiso (Chili). Sailing from Valparaiso on the Steamer *Santa Luisa*, of the Grace Line, for Panama, Dr. LeClaire stopped at different ports on the coast of Peru; then from Balboa, Panama, to Los Angeles, by the Steamer *Manchuria*, of the Panama-Pacific Line, and then from Los Angeles to Calgary by way of Seattle and Vancouver. The winter of 1923-24, Dr. LeClaire spent in Honolulu and the Hawaiian Islands, which proved to be a wonderful spot with a perfect climate.